The RUBBER AGE

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# LATE NEWS of the Industry

## Tire Manufacturing Companies Announce Price Reductions From 5 to 12 Per Cent

FOLLOWING the reductions in tire prices announced by Sears, Roebuck & Company and Montgomery Ward & Company, leading mail order houses, at the end of December, the leading rubber manufacturing companies cut their own price schedules on passenger car casings and tubes from 5 to 12 per cent during the week of January 12. The new prices are the lowest in history and are made possible by the current low costs of crude rubber, cotton and carbon black, the chief constituents of tires.

The first notice of price cuts by manufacturers came from the Goodyear Tire & Rubber Company of Canada and other Canadian factories on January 6, this reduction ranging from 10 to 15 per cent. A premature announcement of a 5 to 10 per cent cut by John A. MacMillen, president of the Dayton Rubber Manufacturing Company, on January 7 was later retracted and declared to be due to "a misunderstanding."

The first definite American announcement came from the Firestone Tire & Rubber Company, reaching the company's dealers on January 10. According to Akron newspaper reports, it had been known for almost a month that the Firestone January price lists would show cuts from 6½ to 12 per cent. The actual list revealed reductions from 7½ to 11 per cent for first line balloon tires and from 6½ to 12 per cent for secondary line tires, such as the Oldfield.

Publication of the Firestone list was followed quickly by similar reductions on the part of the B. F. Goodrich Company, Seiberling Rubber Company, United States Rubber Company and General Tire & Rubber Company on January 12 and by the Mohawk Rubber Company and India Tire & Rubber Company the following day. The Goodyear Tire & Rubber Company did not follow suit until January 14, when an announcement stated that adjustments had been made in tire prices to its dealers "to enable them to be in a position to meet the recent tire price reductions made by other companies."

Discounts to dealers, which had been increased from 21¼ to 25 per cent by all manufacturers on November 1, 1930, were left unchanged and because of the unchanged schedule of discounts to dealers the reductions will be passed directly to the public. There were no reductions by any manufacturer in the case of truck or bus tires, but inner tubes for passenger cars were cut about 5 per cent in price.

In a statement reported by newspapers on January 5, P. W. Litchfield, president of the Goodyear Tire & Rubber Company, had discounted reports to the effect that tire manufacturers might get together to fix prices or raise prices. "There were about 7,000,000 fewer tires sold last year than in 1929," Mr. Litchfield said. "Manufacturing facilities have been increased in the last few years. Factory facilities ran ahead of demand. When this condition exists in a freely competitive market, prices are certain to be forced downward. The tire industry can not hope to escape the law of supply and demand any more than any other industry."

"With this reduction," General Tire & Rubber Company officials were quoted as saying, "we feel that the bottom has been reached."

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## United States Rubber Company Buys Interest in Gillette Rubber Company

TOGETHER with the announcement that the United States Rubber Company has completed the final details of its acquisition of control of the Samson Tire & Rubber Corporation, Los Angeles, Cal., it was officially stated on January 19 that "a substantial stock interest" in the Gillette Rubber Company, Eau Claire, Wis., has also been acquired.

The Gillette Rubber Company, established in 1916, has been fairly successful among the smaller units of the tire manufacturing industry. In addition to producing a high grade line of casings and tubes under its own name, this company has in recent years produced an appreciable part of the requirements of Montgomery Ward & Company, Chicago mail order and chain store organization.

The company in 1929 increased its capitalization from $1,290,000 to $3,000,000 to provide for expansions. It was stated at the time that the capacity of the factory would be increased to 10,000 tires a day by plant extensions.

The officers of the company include R. B. Gillette, chairman of the board; R. W. Hutchens, president and general manager; S. G. Moon, vice-president; C. B. Reyn-

olds, secretary and treasurer; and H. C. Olson, assistant secretary and assistant treasurer. The directors, in addition to Messrs. Gillette, Hutchens and Moon, are William Kootz, John Rossi, H. D. Whitehouse, A. L. Martin and Fred Hawley.

## Tire Factory Operations Increased To Meet the Spring Shipping Demand

OPERATIONS at tire factories throughout the country were appreciably stepped up with the start of the new year in order to meet the demands of the spring shipping season. Plants in Akron and in other rubber manufacturing centres have been running on production schedules appreciably higher than those of December, and more than one factory has doubled its output in recent weeks.

During the week beginning January 5, the Goodyear Tire & Rubber Company increased its rate of production to 48,000 tires a day, operating on a five-day week basis, as compared to its low schedule at the end of 1930 of 30,000 tires a day, four days a week. The United States Rubber Company is believed also to have made a heavy increase in its Detroit factory output over the December rate. The Fisk Rubber Company is producing about 11,000 tires a day at its Chicopee Falls plant, but is understood to be operating on a four-day week basis.

It is understood that the production of casings at some of the leading factories in the Akron district during the five-day week starting January 5 was as follows:

| | |
|---|---|
| Goodyear | 240,000 |
| Goodrich | 125,000 |
| Firestone | 125,000 |
| General | 22,000 |
| Seiberling | 15,000 |
| India | 7,500 |
| Mohawk | 6,000 |
| Mansfield | 24,000 |

Shipments for spring dating are already heavy in comparison with the business done during the past few months, and it is expected that any fluctuation in tire production and sales in the near future will be upward rather than downward.

## Domestic Rubber Consumption Estimated At 372,628 Long Tons for Year of 1930

CONSUMPTION of crude rubber by American manufacturers in the month of December is estimated at 21,493 long tons, according to the statistics compiled by the Rubber Manufacturers' Association. This compares with estimated consumption of 23,479 long tons in November and 23,531 long tons in December, 1929. The figures reveal an extremely low volume of activity in the rubber manufacturing industry at the close of the year, as the December total was the smallest monthly absorption since November, 1923, when the United States used only 20,437 long tons.

Based on its monthly and quarterly questionnaire reports, the Rubber Manufacturers' Association has made an estimate of total 1930 domestic rubber consumption at 372,628 long tons. This figure is well below the consumption in 1929 of 466,475 long tons and in 1928 of 442,227 long tons, and is practically on a level with the 1927 absorption of 372,528 long tons. It was also lower than the consumption during 1925 and marks, therefore, the fourth highest year in that respect in the history of the industry.

The association estimates, according to its own figures, that imports of crude rubber during December amounted to 34,895 long tons. Imports for the full year of 1930 are estimated at 488,343 long tons.

Stocks of crude rubber on hand and in transit overland on December 31 totaled 203,221 long tons, the highest on record, as compared with 189,925 long tons at the close of November and with 118,609 long tons on December 31, 1929. The amount of crude rubber afloat to American ports at the close of the year was 56,035 long tons, comparing with 52,538 long tons on November 30. The combined figure for stocks on hand and afloat of 259,256 long tons is practically equal to 70 per cent of the entire year's consumption.

## Dexter Rubber Corporation Declared Bankrupt in Federal District Court

THE Dexter Rubber Corporation, New York City, was petitioned into bankruptcy on December 30 in the United States District Court in New York. The Irving Trust Company, New York City, has been designated as receiver, and a preliminary schedule filed shows liabilities of about $135,000 and assets of approximately $20,000.

The Dexter Rubber Corporation owns and operates the Dexter Rubber Manufacturing Company, Goshen, N. Y. Established in 1922 by E. B. Dexter, the latter company operated a reclaiming plant with a capacity of 1,000 tons of reclaimed rubber annually, but in later years has specialized in tire and tube repair materials under its "D-D" brand and in adhesive tapes.

Last February the company announced that it had increased its plant facilities from a capacity of 1,500,000 pounds of rubber products to 8,000,000 pounds. At the same time it added to its automotive accessory department the Stick-Rite flap for Model A Ford rims. It also introduced Twin Tape, a new patented process which includes a combination of rubber and friction tape in a single unit.

The petitioners in the bankruptcy action were the Federal Printing Company, with an account of $245; P. & C. Printing, Inc., $160; and the Eastern Folding Box Company, Inc., $200.

C. Hoffman was named president of the Dexter Rubber Corporation last year, succeeding H. M. Webster. Carlyle W. Myers has been vice-president in charge of sales and advertising, and Merton E. Jones factory manager.

## Rubber Goods Exports Reveal Declines Of 23 Per Cent in 11 Months of 1930

FOR the first eleven months of 1930 the Department of Commerce reports the value of United States exports of rubber and manufactures as $55,045,222, a decline of slightly more than 23 per cent from the total for the same period in 1929 of $71,508,572. Truck and bus casings and rubber bands were the only items showing increases during the period, all other rubber products revealing sharp declines.

The amount of tire fabric exported in the first eleven months of 1930 showed a decided drop from the 1929 figures. Shipments of cord tire fabric last year totaled only 906,074 square yards, valued at $332,589, as compared with exports in the 1929 period of 4,858,741 square yards, worth $2,171,020. Other tire fabrics exported from January to November, 1930, were valued at $204,776, as against exports worth $458,847 in the same period a year previous.

## Giant Toy Balloon in Parade

*One of the large helium filled balloons made by the Goodyear Tire & Rubber Company shown in a New York parade staged by R. H. Macy & Company*

Domestic exports of carbon black in the eleven months ending November, 1930, totaled 76,875,683 pounds, valued at $5,341,424. In the corresponding period of 1929, there were exported 83,271,648 pounds of carbon black with a value of $7,402,530.

Imports of rubber and manufactures by the United States in the first eleven months of 1930 were valued at $133,443,324, compared with imports with a value of $223,261,185 in the like period of the previous year. Practically all of this total was represented by crude rubber, latex and other gums, and the sharp decline reflects the deflation in prices of these commodities. During that time, the United States imported 6,914 rubber tires, worth $80,601, as against the previous year's total of 4,370 tires, valued at $63,537. The value of other rubber manufactures imported last year, however, shrank to $1,134,040 from the figure of $2,091,493 in the same eleven months of 1929.

## Murray Rubber Company Receivership Is Made Permanent by Federal Court

FEDERAL Judge William N. Runyon has placed the Murray Rubber Company, Trenton, N. J., into the hands of a permanent receiver. Alfred H. Branham, vice-president and general manager of the firm, has been named by the court to act as receiver and to conduct the affairs of the company until financial conditions can be settled.

The company was originally petitioned into an equity receivership last November, following the failure of Caldwell & Company, prominent Tennessee banking house, which had backed the Murray organization in its recent program of expansion. Mr. Branham was appointed equity receiver at that time and posted a bond of $50,000. Application for the receivership was made on behalf of Miller, Franklin & Company, Inc., who claim $15,676 for services as industrial engineers.

According to the original bill, liabilities were said to amount to $2,495,000 and assets were said to exceed that figure, although no definite amount was stated at the time. Mr. Branham has stated that the Murray company has a large selling organization with 1,398 dealers operating in 30 states. About $100,000 worth of tires are sold each month, he declared.

During the last two years, the company has abandoned its mechanical goods business and has concentrated on the marketing of tires and tubes. It has operated on a co-operative chain store plan by which its dealers are designated as Murray tire stores, but without the company acquiring any financial interest.

## November Output of 2,653,861 Casings The Lowest for Any Month Since 1923

PRODUCTION of pneumatic casings for the month of November is placed by the Rubber Manufacturers' Association at 2,653,861, a decrease of 25.9 per cent under the October figure of 3,582,416. Production for November, 1929, amounted to 3,378,221 casings. The total for November, 1930, marks the lowest production figure for any month since the middle of 1923.

Inventories of pneumatic casings on hand November 30 show a reduction of 2.1 per cent as compared with October 31. The Rubber Manufacturers' Association reports 9,594,732 casings in the hands of manufacturers November 30 as against 9,802,687 casings on hand October 31.

Shipments of pneumatic casings for the first eleven months of 1930 exceeded production by 4.2 per cent whereas during the same period of 1929 the excess was less than 1 per cent. Shipments of pneumatic casings for the month of November amounted to 2,834,331 as compared with 3,499,300 casings in October, 1930, and 3,338,671 a year previous.

Inner tube shipments exceeded production slightly in November, although the reverse was true in the preceding month. During November, there were 2,679,511 inner tubes produced and 2,788,317 tubes shipped, leaving a stock in manufacturers' hands of 10,313,040 tubes. Solid and cushion tire shipments once more exceeded production, bringing stocks down to the lowest level in years.

The tire industry is estimated to have consumed a total of 32,815,895 pounds of crude rubber and 10,522,306 pounds of cotton fabric during the month of November in the manufacture of all types of tires and tubes.

The association's estimates are based on reports furnished by manufacturers who produce approximately 80 per cent of the total for the United States, but have been adjusted to represent 100 per cent in the above figures.

## Range of Spot Rubber Prices
### Years 1909 to 1930 Inclusive

| Year | Cents per Pound — High | Low | Difference |
|---|---|---|---|
| 1909 | 231 | 128½ | 102½ |
| 1910 | 305 | 132 | 173 |
| 1911 | 173 | 110 | 63 |
| 1912 | 139 | 100½ | 38½ |
| 1913 | 113 | 59 | 54 |
| 1914 | 93 | 56 | 37 |
| 1915 | 79 | 58½ | 21½ |
| 1916 | 102 | 55 | 47 |
| 1917 | 90 | 52 | 38 |
| 1918 | 57½ | 40 | 17½ |
| 1919 | 57 | 38½ | 18½ |
| 1920 | 56½ | 16 | 40½ |
| 1921 | 20⅞ | 11¾ | 9⅛ |
| 1922 | 29 | 13⅝ | 15⅜ |
| 1923 | 37⅛ | 24⅝ | 12½ |
| 1924 | 40⅛ | 17⅝ | 22½ |
| 1925 | 121 | 34⅜ | 86⅝ |
| 1926 | 88½ | 36¾ | 51½ |
| 1927 | 42 | 33¼ | 8¾ |
| 1928 | 41 | 16¾ | 24⅜ |
| 1929 | 26⅞ | 15½ | 11⅜ |
| 1930 | 16½ | 7½ | 9 |

*(Herron, Rodenbough & Meyer)*

**(Other news of the industry will be found on Pages 415-421)**

# More Statements on the Outlook for 1931 in the Industry

## O'Neil and Firestone See Large Renewal Business as a Result of Worn Out Tires—But Woolner is Pessimistic on Outlook Until the Industry Corrects Its Own Faults

A NUMBER of statements from leading executives in the rubber manufacturing industry, received in reply to the request of THE RUBBER AGE for expressions of opinion as to the outlook for the industry in 1931, arrived too late to be included in the issue of December 25, 1930, but are published below. The statement of Harvey S. Firestone, is in addition to the one previously printed, which was part of his annual address to stockholders of the Firestone Tire and Rubber Company.

### Badly Worn Tires Must Be Replaced

WILLIAM O'NEIL, *President, General Tire and Rubber Company*

More automobile tires will be made and sold in 1931 than were made and sold in 1930, regardless of the condition of business generally. If business generally improves, this will give a considerable additional impetus to tire production. In the rubber industry, in 1930, we know that the public consumed more tires than were made. Stocks of tires in manufacturers' hands today are 20 per cent less than they were a year ago and there are 25 per cent fewer tires in the hands of distributors than there were a year ago. Increased gasoline consumption shows that cars have been run more miles this year. Considering the increased mileage that has been run and the fact that fewer tires have been bought, it is evident that the tires now on the wheels of America's cars are in worse shape than they have ever been. That is why accidents due to skidding have shown such an alarming increase this year. Tires are much smoother than in previous years. People are just awakening to the danger of riding on unsafe rubber. Smoother roads, with increased need for skid-safe tires, have made this danger more real. People are doing more driving on winter roads than they used to. That is why tires give increased mileage for rubber does not wear out as fast in winter as in summer, and that is why present-day motorists need better tires to avoid the adngers to life and limb that go along with winter driving. There is bound to be an improvement in profit conditions in the tire industry in 1931. This is due to the fact that the prices of rubber and cotton have gone below reproduction cost. Some time these raw materials will seek a higher level. Inasmuch as no manufacturer in our line can be shorter than six months, counting merchandise in process, finished goods, and raw materials on hand, a rising market makes this picture more favorable.

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### Big Replacement Business Certain

HARVEY S. FIRESTONE, SR., *President, Firestone Tire and Rubber Company*

All commodities are at the lowest prices in years. What brought about these conditions? Over-confidence and over-production. When we lost that over-confidence we went the other way, and now we are over-pessimistic. However, for some months past we have been consuming more than we have been producing. No one has had any desire to buy anything that it was not necessary to buy. I feel that now we are losing some of this pessimism. We are regaining some confidence. Soon people will realize the growing shortage of stocks—and realize that they can buy cheaper now than they can later. They will then begin to buy, which will restore confidence—and prosperity. It is most certainly true that the country is now short of tires. The automobile industry is talking about the number of obsolete cars on the roads and the grave danger they constitute. A far graver danger is the number of cars travelling on worn tires. Those tires simply must be replaced—and very soon. That means a great tire business for 1931.

### Salvation of Industry Lies Within Itself

W. O. RUTHERFORD, *President, Pennsylvania Rubber Company*

The past year has marked the very rapid development of new channels of tire distribution, which have been in the making for the past several years. Tire trade is being diverted from outlets of the independent dealer type, and at the present time the volume of business accruing to the retailer classified as an individual has shrunk to small proportions. This fact, together with the shrinkage in the industry's unit sales and unreasonably low prices prevailing, creates a most serious problem. The success of "mass production" methods has resulted in the injection of similar theories in connection with tire distribution. Herein lies great danger of profit impairment. Much care must be exercised in changing the buying or selling habits of the nation, and when personalized salesmanship is disregarded all business sentiment and loyalty is stifled, and the goodwill factor ceases to exist. Then, the matter of price becomes paramount and little regard is given to established brands. This would have the effect of minimizing the efforts of those manufacturers who have created and developed a public acceptancy and demand for their products by the expenditure of vast sums of money over a period of years in advertising. A recent issue of *Automobile Topics* stated that 8,000,000 cars now registered are unfit for service. This represents 28% of the total American car registration. It is fair to assume that the mileage covered by these cars in a year would be comparatively small, and statisticians in forecasting 1931 unit tire sales should take this factor into consideration. In addition to the foregoing, the improvements effected in roads and cars and, most important of all, the increased mileage built into tires of present-day manufacture—all have the effect of reducing the replacement unit demand. With no disposition on the part of individual companies to regulate themselves and a lack of response to efforts arrived at industry control, there seems little hope for a general betterment in the tire industry, at least for the coming year.

In fact, it is conceivable that there is scarcely enough business available to sustain the industry, based on the capital structure investments of the respective companies. This will mean that many more tire manufacturers will be unable to maintain themselves or withstand the extremely competitive conditions existing. Capably managed and well financed units, especially those of a size whose productive capacities have not been over-expanded, will enjoy a very decided advantage over such large units as have continued to expanded their production even in the face of the industry's constantly shrinking demand. Like many other industries, tire manufacturers are faced with the problems arising out of excessive over-productive machine capacities. Existing depressed general conditions, plus a disappointing volume during 1930 have aggravated matters.

The salvation of the rubber industry must be forthcoming from within the industry itself. The causes contributing to the unfavorable conditions existing are well known by the individual executives, but it remains for someone, somehow or other to apply the necessary remedial measures and obtain a unanimity of action by the respective and individual units.

An apparent lack of proper regard for the interests of stockholders is an idiosyncrasy, peculiar to some of the rubber industry executives. Were the management of individual companies more inclined to show a reasonable return on their capital structure, a decided improvement in operations would result, as a consequence of the curbing of vicious practices now in general usage.

# *Testing* RUBBER *under* COMPRESSION

## Many New Uses for Rubber Where Resistance to Pressure is Required Demands Accurate Means for Measuring These Properties

THE use of rubber and other materials for purposes requiring resistance to pressure has created a growing interest in the study of materials under compression. Of importance in this connection is the behavior of materials under progressively increasing loads or sustained load, hysteresis characteristics, set, etc. An accurate means of measuring these properties has been developed through the collaboration of the Bell Telephone Laboratories and Henry L. Scott Company. It is not an untried development as some of these machines have been in use for two or three years, not only for development work, but also for control of quality.

Figure 1 shows a cut of the machine. The sturdy construction is clearly indicated. The frame is very heavy and the head of the machine, which carries the stationary plate or jaw, is so rigidly built that there is no yield or "wink" at the maximum pressure of 2000 pounds. Thus machine characteristics are eliminated and the record produced shows the true properties of the material under test. The lower or movably jaw rests on a spring which is compressed by means of a vertical shaft, the upward movement of which is at the rate of 1.5 inches per minute. Two springs are supplied, one for pressures up to 1000 pounds and the other for pressures up to 2000 pounds. In developing the maximum load either spring is compressed only 0.75 inch, which is approximately 11 per cent of its length. Since good mechanics permit a 33 per cent compression of a spring without introducing any set, it is obvious that all possibility of set in the springs of this machine has been eliminated. Proof of this is shown by the fact that three years' service has produced no detectable change in the springs.

### Half Horse Power Motor Used

The motor used is of a half horse power capacity, thus giving a large factor of safety. It may be reversed under full load. The rate of application and release of pressure is the same. These features are particularly important since they permit the determination of hysteresis characteristics of the materials under test.

The head of the machine is so arranged that attachments of various shapes may be employed. Thus, two flat plates, combinations of a flat plate with cylindrical studs or half rounds of various diameters, wedge shaped cutting edges, etc., may be used. This permits the use of special forms to simulate the type of pressure the material is required to resist.

Data in this article supplied by Henry L. Scott & Co., Providence, R. I.

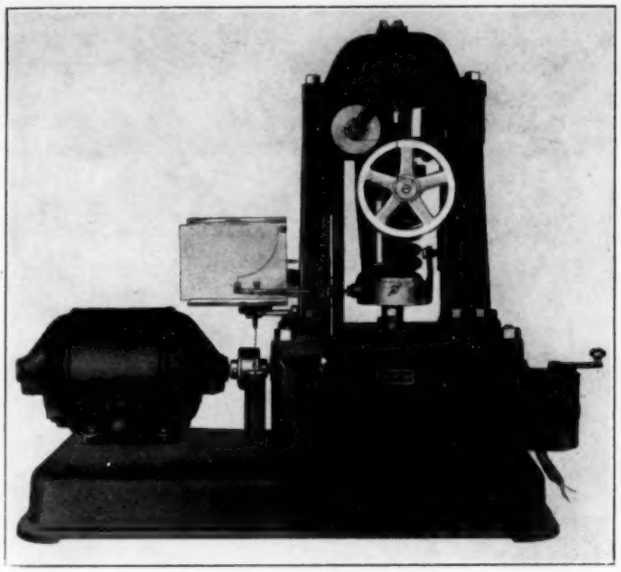

**FIG. 1**
**Scott Compression Tester**

The record of the test from the beginning to the end is made in graph form. The graph is traced on a chart 4½x5 inches, thus permitting accurate reading of the coordinate values. The movement of the jaws is magnified thirty times on this record, therefore 4½ inches on the chart represent a compression of 0.150 inch. The magnification of the compression is of utmost importance in measuring movements of small magnitude. Since it is possible to register on the chart a movement up to 0.150 inch, the machine is adapted to the testing of soft as well as more rigid materials.

### Action of the Recording Device

The accuracy of the recorder movements is demonstrated by the fact that a movement of the jaws without any material between them causes the pen to describe a line along the vertical ordinate, while when the jaws are brought together, the development of pressure causes the pen to follow the horizontal ordinate.

The results obtained by the use of this machine show a wide variation in the compression characteristics of deformable materials. Some materials show a gradual deformation as the pressure is increased, others exhibit a definite yield point. In Figure 2 is shown the compression curves of various materials: 1. Cork-filled linoleum; 2. Rubber tiling; 3. Pure balata; 4. Tire tread; 5. Cork. These curves are taken from a paper on "Compression and Shear Resistance of Rubber" by J. H. Ingmanson and A. N. Gray, *India Rubber World*, July, 1930.

The value of the compression tester in a practical way has been definitely established by its use in controlling the quality of rubber covered wire used by the Bell Telephone System. Its use for this purpose is discussed in the paper referred to above. Tests on compression, shear, and adhesion of the rubber cover to the conductor are made. These properties are important factors in judging the quality of the insulation.

The compression test is carried out by placing a piece of the rubber covered wire between flat anvils and compressing until the conductor cuts through the cover against one or both anvils. Simultaneous breaks on both sides of

the conductor, particularly when occurring in repeated tests made by rotating the sample through 90°, indicate proper centralization of the conductor.

The adhesion of the rubber to the conductor is represented by the difference between the compression results obtained before and after the rubber cover has been

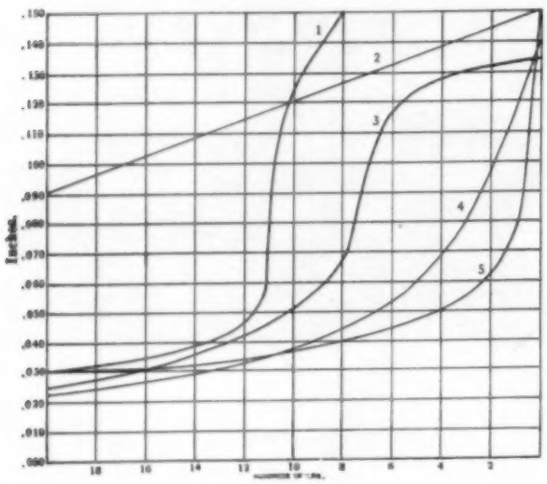


FIG. 2

**Compression Characteristics of Various Materials (1) Corked-filled Linoleum (2) Rubber Tiling (3) Pure Balata (4) Tire Tread (5) Cork**

loosened by amalgamating the tin coating on the conductor.

The pressure required to shear, or cut through, the rubber cover is determined on a sample of the insulation which has been removed from the conductor. The tube is slit longitudinally and subjected to the pressure of a cutting edge having the same radius of curvature as the conductor. The pressure required to cut through the rubber is the shear load or resistance to cutting. The shear test has been in use for three years in evaluating all kinds of rubber stocks.

### Wide Range of Information Obtainable

In a paper on "Some New Developments in Physical Testing of Rubber," published in *I. R. I. Transactions*, Vol. VI, No. 2 (1930), Dr. A. A. Somerville discusses various tests by means of the compression tester which illustrate the wide range of information obtainable by this method. The results of these tests bring out characteristics of materials which are of great interest to every compounder and cannot fail to offer many suggestions for new lines of development.

The tests were made with a 90° wedge having a cutting edge of 0.0008 inch wide. The wedge constituted the upper jaw of the machine against which the sample, resting on a flat anvil, was forced. This anvil formed a part of the bottom of a small tank, thus permitting the test to be carried out with the sample immersed in water. The tank was equipped with a temperature control which permitted holding the temperature of the water at any desired point between 0° and 100° C. The high degree of accuracy of this method is shown by the fact that seven tests made on the same stock showed less than 5 per cent variation in the shear load.

The way the resistance to cutting of a rubber stock is affected by the use of various materials and varying amounts of the same material is clearly demonstrated. Figure 3 shows the effect produced by progressively increasing amounts of carbon black. The addition of 10 and 20 parts produces stocks of lower resistance to cutting than a stock which contains no black. The shear load for stocks containing 30, 40 and 50 parts of carbon black is progressively greater than that of the control. Whiting, on the other hand, causes a falling off of the value of the shear load with each successive addition. Mineral rubber causes first a slight but definite increase in the shear load value and then a decrease. A 25 per cent addition, however, causes a reduction of only about 5 per cent.

The relative value of different fillers in producing a shear resisting stock is illustrated by using equal volumes of carbon black, zinc oxide, whiting and barytes. The resistance to cutting was greater with carbon black and fell off with the others in the order named.

### Factors Influencing Results Obtained

The test brings out clearly the benefit derived from the use of antioxidants and is a quick and easy way of evaluating them. A tread stock compounded with an antioxidant had better cutting resistance after 96 hours in an oxygen bomb than the same stock without antioxidant aged for 48 hours.

While the standard machine is not arranged for studying compression characteristics at various temperatures, such an arrangement, as mentioned above, can be readily effected. As an illustration of the effect of temperature, the

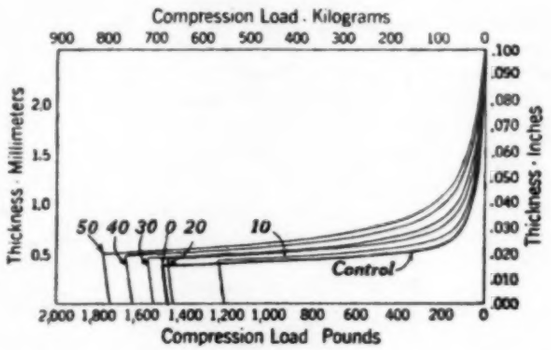


FIG. 3

**Showing Effect Produced by Progressively Increasing Amounts of Carbon Black**

cutting resistance of a tread stock was determined at 0°, 25°, and 100° C. The resistance decreased with increasing temperature, the values at 25° and 100° C. were 85 and 50 per cent respectively of the value at 0° C. The results of tests under controlled temperature should be of great interest and value, particularly in the development and control of stocks subjected to a wide range of temperature. For example, in tiling, the effect of localized heat from hot water or steam pipes may be an important factor in its serviceability.

The principal factors which influence the results obtained by means of the compression tester are: area under compression; gauge of sample; condition of surface, such as bloom, and whether it is dry or wet with water or other lubricant. No carefully prepared sample is required. The tests are quickly and conveniently made and the results accurately recorded. It should prove to be a very valuable addition to the equipment of all laboratories, particularly those interested in compression problems on such materials as insulated wire, rubber shock absorbers, floor coverings, etc. Its value is attested to by the fact that a number of these machines are in daily use.

# Toxic Substances *in the* Rubber Industry

## PART XVIII

*By* **P. A. DAVIS, A.B., M.A., M.D.**

*Assistant Medical Director, Goodyear Tire & Rubber Company*

### Hydrogen Sulphide

HYDROGEN SULPHIDE or sulphuretted hydrogen as such is not used in the rubber industry as a component of rubber compounding, but its presence is very much in evidence because of the large amount of sulphur and sulphur compounds that are used. There are three combinations of sulphur and hydrogen that are important, namely, $H_2S$ –Mono sulphide gas

$H_2S_2$–Di-sulphide–yellow liquid

$H_2S_3$–Tri-sulphide–yellow liquid

The mono-sulphide, or what is commonly called hydrogen sulphide, is a gas which is very inflammable, has a sweetish taste and a very disagreeable odor of rotten eggs. Even in very minute quantities it can be detected by its odor. It has a density of 1.1895 and can be converted to a liquid at –61.8° C. The gas can be passed into water where it is absorbed 1 part to 4½ parts of water.

Sulphur is used in rubber and when milled combines with many other substances producing unstable sulphides which decompose at curing temperatures and liberates $H_2S$. Many of the Thio-compounds are decomposed and liberate sulphides and hydrogen sulphide. Hexamethylene in the presence of sulphur when cured produces $H_2S$ and other sulphur compounds.

Hydrogen sulphide can very readily be prepared by treating metallic sulphides with strong acids, for example:

$$FeS \text{ plus } H_2So_4 \text{———} H_2S \text{ plus } FeSo_4$$
$$FeS \text{ plus } 2Hcl \text{———} H_2S \text{ plus } Fecl_2$$

also by passing hydrogen through boiling sulphur,

$$S \text{ plus } 2H \text{———} H_2S$$

or exposing sulphides at high temperatures to hydrogen.

$$Sb_2 \text{ plus } 3H_2 \text{———} 2Sb \text{ plus } 3H_2S.$$

When $H_2S$ burns it forms water vapor and $So_2$.

$$H_2S \text{ plus } 30 \text{———} H_2O \text{ plus } SO_2.$$

Sulphuretted hydrogen tarnishes metals where the sulphide formed is black, such as silver, copper, etc.

In the rubber industry $H_2S$ is a by-product as it is in many other industries, but in others it is a basic substance. However, whether it is a by-product or a basic substance, it is still very toxic and industry must guard its workers. $H_2S$, as well as all other volatile sulphides, is destructive to many things with which it may come in contact. I have seen the paint on houses where the pigment is white lead, discolored and vegetation in the vicinity of a waste pipe destroyed. $H_2S$ is present in the following industries either as a by-product or a basic substance:

1. Blast furnaces—smelting industry
2. Manufacture of sulphides
3. Distillation of sulphides
4. Sulphide dye colors
5. Leblanc soda manufacture
6. Chemical industry
7. Rubber industry
8. Sugar industry
9. Illuminating gas plants
10. Tanneries, and many others.

$H_2S$ is present in the intestinal canal in varying amounts and often to a great extent when there is putrifaction of albumen, or when there is a large protein diet containing Sulpho-proteids. There results the formation indoxyl and skatoxyl sulphuric acids which are extremely toxic and show an immediate effect on the human system.

#### Methods of Absorption

1. Respiratory system
2. Gastro intestinal
3. Skin.

All gaseous sulphides are absorbed quite readily through the respiratory system. Liquid and soluble sulphides are absorbed equally as quick through the mucous membrane of the gastro-intestinal system. Skin absorption is very slow under ordinary conditions, but if a liquid sulphide such as $CS_2$ is applied to the skin absorption will take place readily and in some cases where there are organic sulphides formed at the surface by a gaseous sulphide, absorption takes place. The rate of absorption determines whether the condition is acute or chronic.

The human system developes a low tolerance for $H_2S$ and after that is passed a sudden cumulative effect proves fatal. In the very acute cases there is a sudden insensibility, dizziness, labored respirations, convulsions, asphyxia and death. In these cases there is no relief as it is so sudden. Thenard's experiments have shown that 1 part to 800 are immediately fatal to a dog. The fatal concentration for the human varies, as to his susceptibility, but 2 to 3 parts per 1,000 is almost always fatal.

The acute symptoms are:

1. Uneasy feeling—nervousness
2. Nausea and gastric distress
3. Pounding in head—dizziness
4. Irritation of eyes nose and throat
5. Difficulty in breathing
6. Tachycardia
7. Oedema of the lungs
8. Convulsions
9. Coma
10. Death or a slow recovery with a development of an irritative pulmonary condition.

The chronic symptoms are:

1. Tiredness, muscle aching, and lack of ambition. These are the expressions that the workers give on questioning. Occasionally a diagnosis is made of rheumatism or myositis, when in truth the condition is due to $H_2S$. Personal experience has corroborated these feelings.
2. Irritation of the eyes, nose and throat.
3. Headaches.
4. Symptoms of gastric ulcers.
5. A feeling that one has a high blood pressure, when it is really normal or subnormal.
6. There is in some cases a disturbance of vision and a sense of dizziness when the eyes are closed.
7. The stools change color, and the sulphur derivatives are increased.
8. The urine is dark and contains an increased amount of indol and skatol.
9. There is a loss of weight and pain in the chest and the individual begins to think of tuberculosis.
10. The blood shows a leukocytosis with increased sulphoproteid granules. The red cells show a poikilocytosis, anisocytosis, granulation and a minus color index.

11. Gradually as the condition progresses the individual develops a pale to cachectic color.
12. The opsonic index of the blood is lowered, calcium metabolism is increased and the protective power of the body is so lowered that intercurrent infections develop.

Hydrogen sulphide is just as dangerous as HCN and CO and must be handled as such.

An antidote for the acute cases that is worth trying is the inhalation of dilute chlorine. This can be done by placing a bleaching powder on a towel and moistening it with a little vinegar and let the individual inhale the fumes. Prevention is, of course, the best method and this can be instituted as follows:

1. Removal of all $H_2S$ fumes and conduct into a gas burner.
2. All operations where $H_2S$ is formed should be perfectly ventilated with suction.
3. Dissemination of fumes should not be done for 0.5 part to a thousand is serious.
4. If there is a slight odor of $H_2S$ the air should be analyzed. Keep the concentration below 0.01 per 1,000.
5. Frequent examinations.
6. Transfer to well ventilated rooms individuals that have headaches or a tired feeling.
7. Instruct workers concerning their general health.

### Treatment

1. *Acute Cases.* If these are the sudden types, inhalations of dilute chlorine, oxygen, artificial respiration, hypodermic injections of alpha lobelin, camphorated oil, ether, strychnine, and digitalis.

2. *Sub-acute Cases.* Those that have survived the acute stage with some serious complication. The most serious is an irritative pneumonia and this should be treated by:

1. Oxygen inhalations.
2. Inhalations of Tr. of benzoin compound.
3. Heart tonics.
4. General iron tonics.
5. Intravenous glucose injections.
6. Calcium salts.
7. Argyrol for the eyes and nose.

3. *Chronic Cases:*

1. Removal from contact with $H_2S$ and placed on work where there is plenty of fresh air.
2. Establish elimination through the intestinal and genito-urinary tracts by alkaline cathartics and diuretics.
3. Hot baths and body massage.
4. General tonics.
5. Milk and vegetable diet.
6. Sodium salicylate or acetyl salicylate for muscle aches and headaches.
7. Anti acid compounds containing calcium.
8. If there is an irritative bronchitis give some sedative cough medicine containing codeine.
9. Treat boils surgically.
10. Treat other conditions symptomatically as they arise.

The cases that survive the acute stage usually all recover with very little after effect and in the course of a short time are well. Any person who has had $H_2S$ poisoning seems to be very susceptible to small quantities of it and can detect it in very minute quantities.

### Conclusions

The sulphides of hydrogen are very toxic and should be treated in the same category as HCN and CO.

All operations involving $H_2S$ either as a by-product or as a basic substance should be performed in a closed system.

All excess or by-product gas should be conducted to a burner where it is destroyed. In any operations where it is necessary to come in contact with $H_2S$ gas masks should be worn.

Frequent inspection of pipes and hoods may prevent any disastrous conditions.

Frequent examination of the personnel is essential.

Keep the concentration of $H_2S$ down as low as possible and certainly 0.01 parts to a 1,000 or lower is possible.

If properly handled and a sufficient low concentration is maintained and a destruction of excess gas is accomplished, one should not experience any detrimental effects.

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## Scrap Rubber Into Japan

THE increased use of scrap rubber by Japan can be seen in the late official figures covering scrap rubber imports into that country, which are tabulated as follows:

| | *Pounds* | *Dollars* |
|---|---|---|
| 1927 | 2,892,340 | 76,346 |
| 1928 | 3,969,826 | 102,980 |
| 1929 | 6,231,987 | 149,649 |

During 1928, 567,780 pounds were entered through Yokohama, 2,797,806 pounds through Kobe, and 604,238 pounds through Osaka, the leading sources of imports in 1928 being: United States, 3,295,110 pounds; Australia, 450,247 pounds; and China, 99,599 pounds.

The imported rubber of this class is comprised chiefly of pneumatic automobile tires, tubes, and solid tires. Other kinds of used rubber are not imported in considerable quantities owing to the diversity of quality and the consequent difficulty in handling. Factories manufacturing rubber-soled "tabi" (a footwear peculiar to Japan), sandals, and canvas shoes, constitute the principal local market for old and scrap rubber. The greater part of the imported product is used locally, although there is some re-export trade to China, particularly in solid tires adaptable to use on carriage wheels.

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## Soviet Tires in Finland

AUTOMOBILE tires of all sizes coming from Soviet Russia, manufactured by Resinotrust, are appearing in Helsingfors, according to advices received by the Department of Commerce. These tires are built along conventional lines and appear to be of good quality. One of the tires fitted on an omnibus has run 27,000 kilometers, and a number of taxis are now equipped with these tires. They are sold about 25 per cent under other tires. Distribution is not yet very general, but the price differential is a strong appeal to some buyers.

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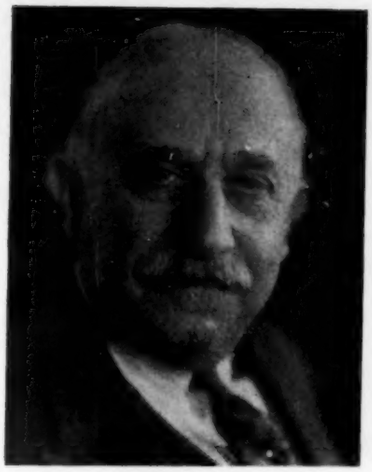
## World Prices of Gasoline

THE following tabulation shows the retail prices prevailing in various cities of the world during the third quarter of 1930, as compiled by the Petroleum Section, Minerals Division, Department of Commerce, from reports submitted by consular officers and foreign representatives of the Department. The prices quoted for the various cities are not comparable, without taking into account the many factors which tend to make inequalities in price, such as distance from sources of supply, tariff duties and excise taxes, etc.

Gasoline sold at the highest price in Addis Ababa, Ethiopia, and at the lowest in Budapest, Hungary.

| *Country and City* | *Price in U.S. Cents per Gal.* |
|---|---|
| Argentina, Buenos Aires | 28.0 |
| Australia, Sydney and Melbourne | 50.7–54.7 |
| Bolivia, La Paz | 57.0 |
| Brazil, Rio de Janeiro | 39.7 |
| British Malaya, Singapore | 43.5 |
| Cuba, Habana | 24.0–30.0 |
| Ethiopia, Addis Ababa | 67.2 |
| France, Paris | 30.0 |
| Germany, Berlin | 31.4 |
| Hungary, Budapest | 14.4 |
| Italy, Genoa | 39.7 |
| Japan, Tokyo | 20.3 |
| Netherlands, The Hague | 24.0 |
| Philippine Islands, Manila | 34.1 |
| United Kingdom, London | 33.4 |

# Woolner Calls on the Industry to Revamp Its Foundation



SAMUEL WOOLNER, JR.

President of the Rubber Manufacturers' Association

## He Reviews Ills of the Industry and Berates Its Leaders on the Lack of Any Constructive Effort Made to Correct the Prevailing Conditions

EDITOR'S NOTE: *The following address by Samuel Woolner, Jr., president of the Rubber Manufacturers' Association, was delivered on the occasion of the annual banquet of the Association, held at the Hotel Commodore, New York City, January* 5, 1931, *but was not made available in time to appear in* THE RUBBER AGE of January 10, 1931, *when the annual meeting and banquet of the Association was reported.*

IF THERE be anything to these gatherings, if it is right and proper that we meet annually to listen to the glorification of our country and to the glorification of our industry, then the corollary of that must be equally true, that we have the right and it is proper to view also the seamy side of our industry, both in retrospect and in prospect.

The year 1930 which has just passed—God rest its ashes—has been a trying one to all industries, and particularly so to our own. In other industries when prices for raw materials began falling and when consumption became much below production, it was possible to make a more or less orderly retreat, much more so than in our own industry where we have to have and contract for several months ahead the raw materials necessary. The collapse came so quickly that we could hardly retreat in the proper manner, and the result was that a great many bad practices crept into the industry. We had the three R's: We had reductions, rebates and ruination.

I would like to call attention to a few of the bad things that happened in the industry, although with the limited time at my disposal I can simply mention one of them, which I think was the worst thing that happened in the whole industry during the past year, and that was the war on national accounts. It started with discounts of two tens, three tens, four tens, five tens, until it finally got to eight tens and a five, and it was pretty near ready to be sold in the five and ten cent stores.

**But without mentioning all the ills that crept into the industry in 1930, I want to say that in my judgment the strongest indictment against the industry in 1930 was that there was not one constructive, intelligent effort made to change the foundation of the industry, so that we are confronted for 1931 with a foundation consisting of about 65 per cent of the output sold at a value that is about cost or below cost. That includes original equipment, jobbers' lines, state and county, and your old friend, national accounts.**

With 65 per cent of the industry selling at those values, leaves about 35 per cent to carry the whole industry. It must also be remembered that there is a seepage from the 65 per cent which, on account of the low quotations, is always over both, and there is a seepage in that down into the 35 per cent and plus. Then we have the competition of those jobbers' lines coming into the 35 per cent. So, just as bad money drives out good, it is only a question of time when the whole 100 per cent of the industry, not only including tires, but belting, shoes and everything that goes with it, will be sold on about a cost basis, and how are we going to pay dividends on a billion dollars invested in the industry?

**What is the remedy? We can't build a superstructure on that foundation. We have to have a new foundation, and you cannot have it until the whole thing is revamped. You cannot have it until there is more coordination, more cooperation, until the leaders in the industry think more in terms of their stockholders, of their employees and the public in general. You have to sink all animosities; petty jealousies have got to be waived aside; you have to take the time and the energy to do this. We have to think more in terms of appreciation of our own companies than we do in hatred for our competitors. Until that is done, there is never going to be either peace or prosperity in the rubber industry.**

I have heard it said time and again, and a little more so of late than before, that what the rubber industry needs is an institute, or a dictator, or a czar. I don't happen to agree with that. I am firmly convinced that is not so. There is one message that I want to give you tonight, which I want you to take away with you. That is, if the will is here in the industry to correct itself, there is sufficient constructive intelligence, constructive ability, enough energy and enough integrity for this industry to build a solid foundation upon which can be erected a superstructure that will not only last through 1931, but will last for a great many years to come and will redound to the credit of the industry and to the prosperity of the people taking part in the industry.

# TIRES *and the* RIM-RIDDLE*

## A Discussion of the Merits of the Drop-Center Rim and History of Rim Development in the United States and Abroad—Drop-Center Rims Gaining in Favor

*By* B. J. LEMON

*Field Engineer, Products Development Division, United States Rubber Company*

**DURING car life, tire costs average more than thirty times rim costs. This makes rim design a major tire-problem. High speed, safety, appearance, and service focus present attention on automobile rims, wheels, and tires.**

**The English pioneered the well-base rim and decided that its success depends on the nice adjustment of rim dimensions to the requirements of the tire. English and American international standards of drop-center rims seem likely to be adopted. German drop-center rims resemble the English standard and include a safety type of rim. The French drop-center rim and tire are not interchangeable with other European or with American equipment.**

**In the United States the drop-center rim was first used on Ford and on Lincoln cars.**

**The author advances two factors considered essential for the prolonged success of the drop-center rim in America. One factor is that tires shall mount and dismount with the same or with greater ease than that for flat-base rims. The other factor is that tire service and car-operating safety on drop-center rims shall be comparable with or better than past performance.**

**For light cars the public appears to have accepted the drop-center rim as a step in advance. The years 1931 and 1932 will record car-owner reactions to the rim for larger cars.**

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IN TRYING to solve an industrial problem such as that of the adoption or rejection of a new tire-attachment of which the drop-center rim is an example, it is not as easy as it is in the exact sciences to know, when one has finished, whether one is right or wrong.

### The Rim Is a Major Tire-Problem

No current problem fastens its tentacles on the tire industry with such retarding force as the world-wide riddle of the rim. In one distorted form or another, rims have linked the tire to the wheel of the most forward transportation movement in history. In the past, a question of heated international and interindustrial disagreement, the present situation regarding the rim is more than ever a riddle of riddles.

The rim equipment of the automobile generally lasts during the life of the car; but it is not so with tires. Three sets of tires may be worn out on one set of rims. A tire costs eight to ten times more than a rim. Three tires worn out on a rim have a value, therefore, of from twenty-four to thirty times the rim value. That is the significant reason why tire engineers pay so much attention to rim design as related to tire service.

New car-speeds that thrill and yet provoke our fears for safety, manufacturing competitions whetted sharp by combinations and recessions, national efforts to protect home industries, requirements of low and light weights, of beauty and simplicity, of noiselessness and easy service; these conditions have focused the spotlight of interrogation on the 1931 attachments that hold the pnuematic tire to the automobile wheel. In the confusion, car and tire engineers now grope more than ever, confounded by the riddle in national standards which for years we have confidently hoped might become acceptable international standards. The situation in general is that English-made rims have not been most suitable for American-made tires. French "Bibendum" rims accommodate only French-made tires. German rims take British tires, but are not well adapted to American tires. Table 1 shows the approximate relative extent to which various types of rim are in use on cars, made in the last five years and probably still operating, in some of the more important countries of Europe and in the United States.

**Table 1—A world-wide rim-riddle is indicated by the following estimates of the percentages of types of rim used on automobiles made in the five-year period 1926 to 1931, and now in use in the countries listed.**

| | Flat Base Per Cent | Drop-Center or Well-Base Rims, Per Cent | Metric Bibendum Rims, Per Cent | Clincher Rims, Per Cent |
|---|---|---|---|---|
| England | 35 | 60 | .. | 5 |
| France | 35 | 5 | 55 | 5 |
| Germany | 30 | 50 | 10 | 10 |
| Italy | 60 | 25 | 5 | 10 |
| Scandinavia | 65 | 25 | 5 | 5 |
| Belgium | 65 | 5 | 25 | 5 |
| Spain | 80 | 2 | 10 | 8 |
| United States | 72 | 25 | .. | 3 |

American rims have changed so rapidly in types, widths, contour and nomenclature that the novel rim of today is almost in the junk heap of tomorrow. How, then, can the car maker economically service his car or the tire

*EDITOR'S NOTE: This article is an abstract of a paper presented before the annual meeting of the Society of Automotive Engineers, at Detroit, January 19-23, 1931, and is published with the permission of the Society.

maker know what tire to design that will function on the majority of rims for six months in advance? The situation is so serious that "muddle" paints the present picture much more vividly than "riddle."

### Tire-and-Rim History

The straight-side tire came into use in Great Britain and other European countries about 1888. Along with it came the clincher tire and the single-tube tire, all of them receiving trial with the advent of the bicycle. By 1898 the automobile had created a considerable demand for pneumatic tires. As this demand for heavier tires increased, the single-tube tire was rather quickly eliminated by its inferiorities. The straight-side or wired-on tire was not considered practical, chiefly because there was no easy way to get it on and off of existing rims.

The clincher or extensible-bead tire on a one-piece rim appeared to solve the problem, because the tire beads could be stretched over the flanges of the rim. The clincher tire therefore became the standard for the motor car in Europe as well as in America, throughout the period of development and afterward. It continued to be standard in Europe up to the advent of the balloon tire in 1923, and on American light cars up to 1924.

As to its advantages and disadvantages, the clincher rim, generally made integral with the wheel, although later in a demountable form, was a simple light-weight low-cost rim. It embodied the principle of the fifth wheel, readily acceptable abroad.

In the rim itself, there were few important disadvantages aside from tendencies of early-made rims to rust, due largely to the undeveloped art of rust proofing and to the drawback of the inturned rim-edges which, when bent by road blows, were difficult to restore. The chief objections to the clincher rim were tire disadvantages. The tire was hard to apply and remove, especially in the larger sizes, this being a drawback which was never remedied. As the tire increased in size, the difficulty of stretching the hard-rubber compound in the bead increased. The application of too much power in mounting stripped or broke the beads, particularly of tires in which the bead compound was overcured or had aged and become brittle.

Considerable care was required in applying and removing the clincher tire to avoid pinching the tube either by the applying tools or by the bead itself.

Cutting and breaking above the rim flange were probably the most frequent sources of failure of the clincher casing.

As a result of these shortcomings of the clincher tire, American tire-makers sought some other attachment to hold the tire to the wheel. They turned to the old British straight-side tire, which awaited mainly minor refinements, and a practical rim to popularize it.

### Straight-Side Tires and Rims

The major advantages and disadvantages of the straight-side tire on the straight-side rim, as compared with the clincher tire and rim, are as follows:

An ease of application and removal that has become acceptable in America through general usage and familiarity with the various types of demountable rim. A greater tire-security from inextensible steel-cabled beads. A greater rim-base, giving greater air-capacity and more stable car-roadability. A better tire-service due to the elimination of rim cutting, less tube-pinching, and less damage when run deflated.

The straight-side rim is heavier than was the clincher rim, due to heavier flanges and to bolts and lugs for the demountable type. It is therefore more costly. It is made

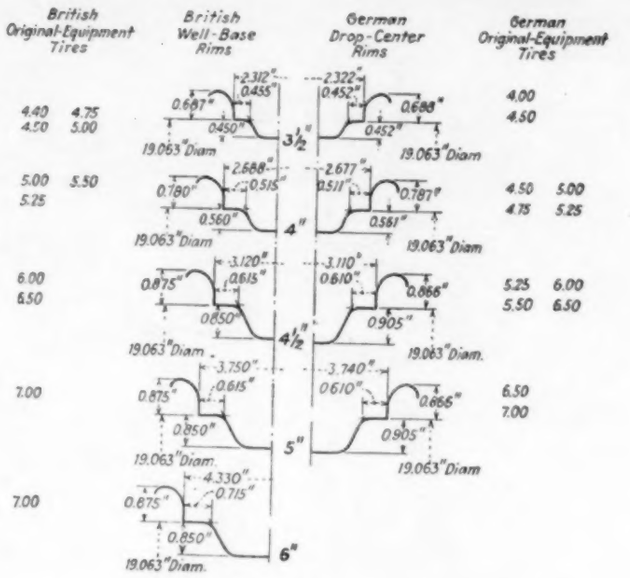


**Fig. 1—British and German Well-Base Tires and Rims**

**British Well-Base Rims Are Shown on the Left. On the Right, for Comparison, Are German Drop-Center Rims (Tiefbettfelden). The Two Standards Ave Very Similar in Dimensions. The Widths between Flanges Are the Same as the Original Series of American Flat-Base Rims. Dunlop, the Largest-Scale British Rim-Producer, Is Planning to Change to the American Drop-Center Rim Line-up, Shown in Fig. 3. Should the German Support Be Obtained for This Program, Such Support Might Furnish the Necessary Impetus for Establishing a World-Wide Drop-Center Rim Standard**

in two pieces, in the detachable-flange type, and this flange sometimes becomes squeaky. The open ends of the detachable flange sometimes allow seepage of water under the bead and, sometimes, if sharp edged, may cut into the bead fabric under severe load.

The transversely split collapsible-rim, unless hinged, may become distorted because of abuse in service. When hinged, it requires a tool to collapse it.

The American flat-base straight-side rim, and the tire for it, have been developed to a high state of perfection. Our great advances in tire design and the resulting immensely increased tire-service have been made, largely, because flat-base straight-side rims have been used over a comparatively long period. Tires fitted to these rims have been reasonably free from those bead and tube troubles that might be traceable to the less practical clincher type of rim attachment.

### The Well-Base Tire and Rim

The drop-center rim, designated "well-base rim" in England, was patented in 1890 by C. K. Welch. The rim, not only standard for bicycles in Europe but also for motorcycles, remained practically dormant so far as automobiles are concerned until the advent of the balloon tire in 1923, when the Dunlop Co. grasped the opportunity to reintroduce the rim in combination with the detachable wheel.

The detachable-wheel well-base-rim combination met the weight and cost objections raised against wood wheels and demountable straight-side rims, first by English and later by Continental car builders; also, it provided a tire-mounting feature quite acceptable to car owners long accustomed to the clincher type of tire. As a result of a well-directed tire-and-rim effort by Dunlop, who controlled tire-and-rim original-equipment in England, 80 per cent of

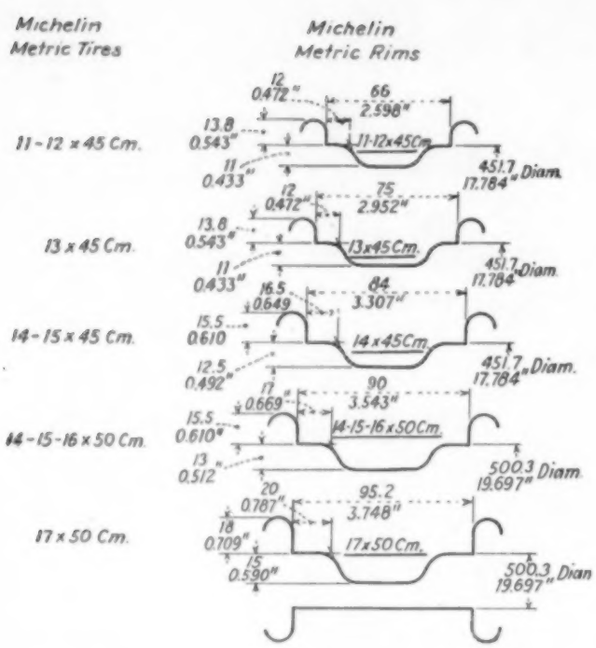


**Fig. 2—Michelin, French, Metric Tires and Rims**

Profiles of French-Bibendum rims, metric and inch dimensioned, as made by the Michelin Company, the largest tire, wheel and rim producer in France. Bibendum rims are single piece and eccentric with respect to the drop-center depression. The well is deepest at the valve hole, decreasing gradually in depth to a flat surface at the opposite side of the rim. Michelin straight-side tires, metric dimensioned, are shown as recommended for Bibendum rims.

new-model British-cars made in 1926 carried detachable-wheel well-base rims. In 1930, this percentage on British-made cars has increased to be almost 100 per cent.

The present British well-base rims for automobiles are shown in Fig. 1. The width of these rims corresponds to the widths of the earlier sizes of American flat-base rims; therefore, they are somewhat narrower than the American standard drop-center rims. Because of the increased use of six-ply medium-pressure tires, British tire-and-rim makers, particularly Dunlop, have been impressed with the advantage of somewhat wider drop-center rims required for these extra-ply tires and have made plans, with a commendable spirit of cooperation, to adopt and to put into production and use the series of drop-center rims recently modified and adopted as an American standard by the Tire & Rim Association, Inc.

### Rim History in Germany

The history of motor-vehicles in Germany discloses the use of a great mixture of makes and types of domestic and foreign-made tires and rims. The German metric-dimension clincher-type of tire and rim lost ground slowly at first but later with increasing rapidity with the coming of the balloon tire and the drop-center rim in England. Safe, easily mounted, water tight, and affording reduced rotating forces, the drop-center rim shown in Fig. 1 is standard equipment today on close to 90 per cent of all German-made cars.

The drop-center rim in Germany is used exclusively in connection with one-piece detachable-wheels. Demountable rims of any construction have never been popular on German-made cars, and demountable drop-center rims are considered technically impossible. The one-piece drop-center rim is combined easily with steel-disc, steel-spoke, and wire wheels, but not with wood wheels.

Recently, German tire-and-rim engineers have given consideration to shallowing the well of the drop-center rim and to reducing the flange height in close proportion. The shallow well, they state, has one disadvantage; it does not give absolute guarantee against the tire coming off, which can happen when strong axial forces act on a much under-inflated or entirely deflated tire and tube in motion.

The Kronprinz Company of Germany has developed a "safety" rim which is designed to combine, so far as tire throwing is involved, the advantages of the drop-center with those of the straight-side rim. In the safety rim, both casing and tube are blocked by a number of elevations made by pressing the well of the rim upward toward the tire seat. At these bridges, the tire cannot slide into the well, while, on the valve seat, the sealing is accomplished by the valve itself, together with the usual tube reinforcement on the valve seat.

The basic idea of the foregoing safety rim, patented in Germany and France, is by no means new in America where attempts have been made to utilize the same general idea in the form of a rim-filler built onto the tube or to function independently of the tube. There is, however, an advantage in having a safety feature, if such a feature is thought essential, incorporated in the rim; namely, that standardized casings and tubes without special construction or dimensions can generally be mounted on the rim.

### French Metric Drop-Center Tires and Rims

The most potential French manufacturer of automobile tires, wheels and rims is the Michelin Co. For years Michelin has held the leadership not only of the tire, wheel, and rim industries in France, but has been responsible for large exports of such French products. The important sizes of Michelin drop-center rims and tires are shown in Fig. 2. The Michelin "Bibendum" straight-side tires and rims, brought out early in 1927 to replace millimeter-dimensioned clincher-tires and rims, established new metric diameter and section standards. Accordingly, these new tires and rims were not interchangeable with the inch standards of European and American manufacture.

At present, about 75 per cent of the cars manufactured in France use Michelin Bibendum metric rims because Michelin will not sell wheels as original equipment without supplying the tires; his price on wheels is so much lower than that of other French wheelmakers that most automobile manufacturers have not escaped buying Michelin tires and rims for their cars. Manufacturers of high-powered French-cars use the English drop-center-rim on wire, disc, wood, and cast wheels. Most of these cars use the English drop-center rim and tires as original equipment.

In 1925, the Ford Motor Co. began experimenting with the drop-center type of rim already well established in England, finally going into production on the 4.40-21-in. tire and the 2.75 x 21-in. drop-center steel-spoke wheel early in 1926.

Early in 1929, the Lincoln Division of the Ford Co. also successfully applied the principle of the drop-center rim to the steel-spoke wheel, and made this type of wheel standard on the Lincoln car. Therefore, the smallest and one of the largest American cars were the first to be equipped with drop-center rims. The rim applied to the Lincoln was 20 x 4.00 in. of the profile shown in Fig. 3 with the dash base-line.

American car-makers generally have been wary of choosing the drop-center rim as standard equipment. Dur-

ing the last year, an impulse to try out drop-center rims has been felt generally throughout the automotive industry. Early in 1929 Chevrolet adopted the rim; first as optional and later as standard equipment. Chrysler, Plymouth, De-Soto, Essex, Dodge, Willys and other makers chose much the same method of introduction; and Austin, our smallest car, came out in 1929 with the drop-center rim as standard equipment.

The disc wheel, next to the wood wheel in order of costs and for a time widely used on American cars, does not appear to have received its merited consideration as a carrier of drop-center rims, in spite of foreign experience. Disc wheels seem to have suffered from an inferiority complex in recent years, and cast wheels never reached a productive status in America. Both types can be combined readily with the principle of the drop-center rim, and it would not be at all surprising if 1931 witnessed the extended use of both types of wheel with drop-center rims.

The wire type of wheel, until recently our most expensive extra-cost type, we have considered best suited for the depressed-base rim. The small producion of the wire wheel in the nipple-spoke form and a complicated patent situation undoubtedly retarded development and accounted for high costs over a long period. However, the last two years have witnessed stimulating absorptions and combinations of wheel producers, resulting in greatly increased development and production activity and corresponding reduced manufacturing costs. Therefore, the stage is set properly today for changing to a drop-center scene with the wire type of wheel as the lead-off performer.

### Five-Year Debate on Well-Depth

Experimental standards were set up by the Tire and Rim Association for passenger-car drop-center rims in January, 1925. The five-year interim has witnessed numerous alterations in these standards with respect to the rim sections themselves, the heights and types of flanges, the widths and diameters of bead seats, and the angle of slope and depth of the well. However, no one of these dimensions has provoked such widespread disagreement and heated debate as that of the proper depth of well.

Space is not available, nor are the interests of the Tire and Rim Industries advanced by a chronicle of the well-depth controversy. The direct result of experience and experiment, both in America and abroad, has brought about in general an appreciable shallowing of the drop-center portions of all sizes of rim, as indicated in Fig. 2 in which the latest recommended-practices adopted in July, 1930, are shown by full-line contours of the well for comparison with standards in force immediately previous to that date, indicated by dash-line contours of the well.

From the tire viewpoint the July, 1930, well-depths are considered minimum for satisfactory tire application and removal. The flange heights are as low as are thought to be good practice for satisfactory bead-anchorage. The rim-bead seat-widths are minimum for the accommodation of four and six-ply tires in the sizes recommended. The lateral slope of the well of 25 deg. is fixed by past experience as the favorable angle at which existing inflations will force the beads out of the well into the proper position on the ledge. The rim-bead seat-diameter is fixed as correct for tight bead-fit to prevent rocking and tube chafing.

### Applying Tires to Drop-Center Rims

The methods of applying tires to American drop-center rims are not and probably will not be made entirely uniform, because all makes of tire do not have the same bead-

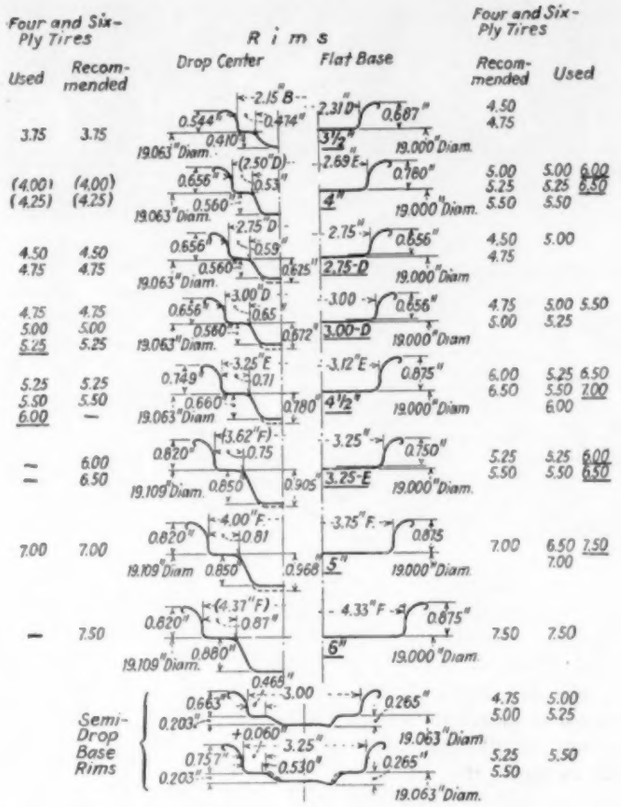


**Fig. 3—American Drop-Center and Flat-Base Tires and Rims**

Comparison of American drop-center and flat-base rims listed in the order of increasing widths between flanges. Two sizes of semi-drop-base rims are shown in the lower center view. The sizes of tires in use on, and recommended for, the three types of rim are listed opposite each rim type and size. Rim and tire sizes in parentheses are not yet in general production. The tire sizes that are underscored, while they are in use on the rims indicated, are not considered by some engineers as being the best practice from the viewpoints of tire width to rim-width ratio, of the flange height and of the relation of tire-bead strength and width to rim-bead seat width. The 19-inch rim-diameter is shown for dimensional purposes. The solid well-bottom lines indicate the July, 1930, standard depths. The dash lines show the former standard depths.

construction and diameters; all rims of the same nominal size do not at present have the same well depth and profile; and those who apply tires in the factories and in the field are not all taught to use the same systems of application. The adoption of uniformity, nevertheless, is highly desirable and steps are being taken to set up a uniform recommended practice of putting on and removing drop-center-rim tires.

Applying tires to and removing them from drop-center rims can be accomplished in two ways. First, by mounting and removing both beads at a time; second, by mounting and removing one bead at a time.

### Production Mounting Discussed

The ease with which the smaller sizes of tires can be applied to their proper size of drop-center rims by factory workmen who have acquired the knack is a revelation. The speed of application varies from 60 to 120 tires per man-hour, depending on the operations included in the mounting procedure. In some plants, applying a rim strip over the spoke heads is part of the mounting operation; in others, bouncing the tire to seat the beads or applying an inflating chuck to the valve stem are operations included.

Good factory-practice is to use a rigid waist-high stand

**Applying Large-Size Tires to the Drop-Center Rim**

FIG. 4—The first operation is to lay the wheel on the floor with the hub cap uppermost. Inflate the tube so that it is just rounded out but not expanded and place the tube in the casing. One bead is hooked over the rim flange, pushed into the well and held in that position by foot pressure. This bead is then worked in both directions over the rim all around with a tire tool.

FIG. 5—The second operation is, if necessary, to tuck back the tube in the casing. Catch the second bead over the rim flange, force it down into the well and hold it there by foot pressure. Working in both directions with a tool, gradually force the bead over the rim all around and take care not to pinch the tube.

FIG. 6—The third operation is to rotate the wheel inside the casing until the valve comes through the valve hole. Screw down and tighten the tube and rim until the balance mark is at the valve stem. Inflate gradually, making certain that the beads seat on the rim evenly all around on both sides.

to which is affixed, at varying angles from the horizontal, a dummy hub to fit the wheel on which tires are to be applied. This hub carries a dummy hub-bolt or other device to lock the wheel against rotation during application. The wheel is placed on this hub with the valve hole at the top or bottom, depending on the mounting procedure employed. When used, the rim strip is applied in the base of the well and is cemented down, particularly at the ends abutting the valve hole.

The casing, with tube enclosed and valve at the balance mark, is placed on the wheel with the valve in the valve hole, for small-size tires, and one or both beads, depending on the method employed, pushed down hard into the rim well. Working both ways around the tire from the valve stem, the beads are pressed together, as for the two-bead method, and down into the rim well until both beads are forced over the rim at a point diametrically opposite the valve hole. Some operators first push the beads into the well, at a point opposite the valve hole, this being a slightly easier but more complicated method, and then work both ways around the tire, forcing the last section of bead over the flange at the valve hole.

### Dismounting Tires from Drop-Center Rims

To take off American small-size tires from drop-center rims, remove the valve cap and lock nut, completely deflate the tube by removal of the valve's insides if necessary and push the valve stem back through the rim hole into the casing. Then press the sides of the tire together and the beads into the well, beginning at the top and working both ways around the tire for approximately 12 in. on each side of the valve. At the point opposite the valve, pull both beads over the rim flange; or, using a tool, lift one bead over the flange at a point opposite the valve, taking care that the tool does not pinch the tube. The second bead can then be lifted over the flange, care being exercised to tuck the tube into the casing to prevent interference.

The application to and removal of the larger-size tires from drop-center rims differs somewhat from operations satisfactory for small-size tires. Large sizes are always put on or taken off one bead at a time. The accompanying illustrations, Figs. 4 to 9, depict the important steps of applying and dismounting tires as recommended by the Lincoln Motor Co.

### Location of the Valve Hole

For a number of years English and Continental makers have located the valve hole in the side of the well, so that the straight valve-stem protrudes outward at an angle rather than vertically in the center of the well, which is the present American practice. There seems to be some important advantages in favor of the English method.

To date there have been no serious handicaps to inflation of the vertical valve in the American steel-spoke wheel; however, since wheel diameters are decreasing and the distance between the brake drum and the rim well is becoming correspondingly narrower, it appears advantageous to consider the adoption of the side valve, at least for 18-in. diameter drop-center wheels. Should 17-in.-diameter wheels be fitted with drop-center rims, the side valve or angle type of valve will be almost a necessity. The laterally placed valve-stem is superior for disc wheels in that it does not require so sharp a curve in the disc to accommodate the vertical valve.

Another advantage of bringing the valve through the side of the rim is that all tubes for drop-center rims can be equipped probably with the same type and length of valve stem, regardless of the wheel type or rim diameter.

### A Semi-Drop-Base Rim

The Motor Wheel Corporation has developed and is in production on two sections of what might be called a modification of the drop-center and of the demountable flat-base rim, known as the semi-drop-base split-rim. For this new rim is claimed the advantages of the full drop-center rim without the disadvantages.

The large majority of American automobile-engineers will get their first year's production and service experience with drop-center tires and rims in 1930 and 1931. Therefore, it is of interest to review some of the opinions that they today express concerning this equipment.

While an abundance of enthusiasm for the acceptance of the new method of holding the tire to the wheel is apparently lacking, the trend today is strong to the drop-center-rim wire-wheel. One engineer states that the increased width of drop-center rims over corresponding flat-base rims results in a larger air-volume without increase in weight

**Removing Large-Size Tires From the Drop-Center Rim**

FIG. 7—The first operation is to lay the wheel on the floor with the hub cap uppermost. Deflate the tube completely. Remove the rim nut and walk on the tire to loosen it from the rim.

FIG. 8—The second operation is to press down the top bead with the knee and, at a point opposite, insert a tool between the bead and the rim flange just far enough to secure a leverage on the bead. One portion of the bead must be in the well before the opposite portion can be lifted over the flange. Work the top bead off all around, and push the valve back into the casing.

FIG. 9—The third operation is to stand the wheel upright so that a section of the second bead is in the well at the bottom. Insert a tool between the bead and the rim flange at the top, and lift off the second bead all around.

or cost, produces greater tire and car stability, and gives the appearance and effect of using the next-size-larger-tire.

I believe that these advantages of appearance and stability are undoubtedly well worth considering but I doubt that, from the tire-service viewpoint, an increase in tire width by unduly spreading the beads, or an increase of air volume by hollowing the rim, will materially increase the tires' carrying capacity and service.

Most car engineers believe that the drop-center rim is a better balanced and a truer-running rim than is the split or detachable-flange rim. It does away with squeaky flanges that leak water inward to the tire seat, leak rust outward to the tire side-wall, and sometimes gnaw insistently into the tire fabric.

### Success Hinges on Two Main Factors

Aside from appearance, cost, ease of rolling the rim, and other commercial aspects, two factors will decide for the car owner whether drop-center rims and tires are better or worse than flat-base rims and tires. One of these factors is whether an improvement over the flat-base rim has been accomplished in applying and dismounting tires to the drop-center rim. The other factor is the service and the safety of the drop-center tire itself.

The first factor, that of ease of mounting and dismounting, is controlled by a number of important interdependent elements: Depth of the well as compared with the flange height; the width of the well at the top; the width of the well at the bottom as controlled by the slope of the sides of the well; the construction, shape, flexibility, and diameter of the tire bead; the amount of air in the tube; and, finally, the methods employed, or knack of putting on and taking off the tires.

The second factor, that of tire service, is closely related to tire application and removal. Until the knack of mounting and dismounting is acquired by the car owner and the field service-man, attempts to force inextensible beads over the rim flanges without taking full or partial advantage of the well will be made and will result in bead abuse even to the extent of breaking the bead wires or of weakening the beads by loosening the wires from the surrounding rubber.

A second influence affecting tire service is the proper design of the inner tube. The tube must have the correct length and cross-section to blow down into the well of the drop-center rims easily and without wrinkles, and at the same time fit the corresponding flat-base rim on which the tire may be applied, both as original equipment and for field replacement. In the past the public has been accustomed, with good results, to using tubes of rather widely different dimensions on flat-base rims. Tubes for drop-center rims must be carefully designed and plainly marked for the size of casing for which they are intended.

A third tire-constituent is the design of the bead. As with the tubes, the bead must be constructed to mount on both drop-center and flat-base rims, but it must be so specially designed and shaped as to hug the rim ledge snugly to reduce rocking, and to make such a satisfactory contact with the tube at the bead toe as to eliminate tube failure by chafing. Any old tube or casing will not give the public satisfactory results on the drop-center rim. Tire makers have spent and are still spending large amounts for equipment changes required by the swing of the industry to the drop-center rim to make tires and tubes perform in a satisfactory manner on both types of rim.

A fourth element that will influence the public greatly for or against the drop-center rim is the safety factor, as related to what happens to the tire and the car when a tire goes flat.

In all countries where the drop-center rim has gone into use, cries of lack of safety have been raised. The utterers of such cries have in some cases been those without adequate knowledge of the facts, in other cases those who were not ready to adopt the rim.

### Conclusion

A highly accelerated trend is under way to a larger use of the drop-center-rim wire-wheel. Some car engineers are feverishly testing equipment, while others are changing over without giving much attention to testing. Wheel and rim makers are rushing in new stocks and production machinery. Tire engineers are balancing changes of stiff against flexible constructions, wide against narrow beads, long against short toes, for tires for next year's four million new-car requirements. At the same time they are trying to make this same product satisfactory for their share of replacement business on the 23 million cars now running.

There are objectionable features to the drop-center rim and tire program, which we who play with it carelessly will discover. The tire-and-rim riddle that has kept us guessing for a third of a century has not by any means reached its solution. Yet we cannot close our minds to the facts that upward of 60 million tires on cars equipped with drop-center rims have rendered a performance that has been highly acceptable to a class of American motorists who evaluate rims and tires by the service and safety they render, as well as by the ease of their application and removal. Therefore, for small cars, the drop-center rim appears to be a step in advance and, hence, a success.

## Rubber Re-odorants in Batch Form

PRESENT day interest in rubber re-odorants and de-odorants is being increased through the recent introduction of these materials in master batch form by Vansul, Inc., 47 Water Street, New York City. These master batches, containing odor-bearing materials, are obtainable in several odors (each tinted for easy identification), depending on the needs of the user and class of rubber products to be odorized or de-odorized. In use, only 1 to 2 ounces of master batch per 100 pounds of mix are necessary.

The advantages claimed for odors in this form are ease of introducing into the rubber compound and accuracy of weighing. It is claimed that the master batches will retain their strength at least for the length of time compounded stock of this nature would normally be carried in inventory.

The odors obtainable are lavender, rose and orange, but any other odor can be supplied. The odors in finished rubber products are recognizable for a considerable period. These re-odorizing materials are claimed to have no effect on the aging or other physical properties of rubber and they can be used in conjunction with all standard accelerators, anti-oxidants and other compounding materials without change in formula.

The disagreeable odor of some compounding materials can be neutralized or covered up by suitable de-odorants.

## Stearex Flake

STEAREX in a new form is now being supplied to the rubber industry, by its manufacturers, Binney and Smith Company. Up to the present time Stearex has been offered to the trade in cake form, except in cases where customers have specified powdered or granulated types, but it has been apparent that a flake form would facilitate handling. The company has consequently now arranged to supply Stearex in this flake form and it will be known as "Stearex Flake."

# EDITORIAL COMMENT

## Tire Prices Again

THE announcement during the fortnight, by the leading tire companies, of a reduction in tire prices comes as regrettable news to those who have been closely watching the struggles of the industry to bring some semblance of profit out of its huge investment. However, whatever may have been the reason for reducing tire prices in the past, in this case the exigencies of the situation warranted the reduction. The cut in price is in line with the reduction in practically all commodities and merchandise. But the most important contributing factor was of course the pressure brought about by the mail-order houses, which had previously announced a reduction in tire prices of approximately 15 per cent. Such a reduction could not be countered by any other means than a similar reduction all along the line.

Although regrettable, the tire industry will have to make the best of it and can only hope that the new prices, the lowest in the history of the industry, will not remain too long at their present levels. Judging from former policies practiced by mail-order houses in the case of previous tire price cuts, little relief in the way of an increase in prices can be expected before late in the summer, as the mail-order houses have persistently held to the lower price levels during the summer months, when their tire business is particularly heavy.

## An Authoritative Exoneration

THE report of the International Commission of Inquiry Into the Existence of Slavery and Forced Labor in the Republic of Liberia has finally published its full report, the release of the document causing little less than a world sensation. Prior to its official issuance, the president and vice-president of the republic both tendered their resignations from these high offices. The complete report discloses the presence during recent years of abuses so appalling as to be more suggestive of medieval times than of the twentieth century.

Despite these widespread conditions, however, the largest single industrial enterprise in that country, the rubber growing concession of the Firestone Plantations Company, is found to be free from any connection with these practices. "There is no evidence," according to the commission, "that the Firestone Company consciously employs any but voluntary labor" among the 10,000 men now at work on its plantations. Moreover, its employes are free to terminate their employment at will.

In view of the loose statements frequently made by demagogic thinkers in recent years concerning this vast project, this report gives reason for congratulation not alone to that individual organization but to the entire industry which it represents. It is not easy for an industrial company to make convincing denial of false statements and rumors, but the clear conclusions of such a painstaking investigation as that conducted under the auspices of the League of Nations must be considered authoritative.

## Indexes of Normalcy

THE "liquidation of the unexpected" in this depression has apparently been completed, according to Colonel L. P. Ayres, vice-president of the Cleveland Trust Company, who believes that this circumstance constitutes the soundest reason for believing that the general business recovery will get under way in the present year.

As he remarked, the year 1930 was full of unwelcome surprises. The world-wide drop in commodity prices was the most serious and discomforting. The severe drought was a surprise; the world-wide political unrest was unforeseen; the erratic dumping of products by Russia was not predictable. The failure of many banks in this country which has fundamentally the soundest of all banking systems, and the strongest individual banking units, was an unexpected development. Finally, the greatest surprise of all was the discovery that business was not fundamentally sound, coming after the almost universal acceptance of the numerous declarations that it was.

But business has to go on because the life of the nation goes on, and so business always adjusts itself to new conditions, no matter how unfavorable they may be. In all our long business history the second year after a panic decline has never been as bad as the first year. Before the end of the second year business has always had its readjustments far enough along to get under way at an increasing pace.

The 31st annual automobile show in New York has come and gone and will be followed in the next few weeks with others in the leading cities. The enthusiasm and interest manifested bespeaks well for the industry during the year. The attractiveness of the prices for cars this year makes them compelling bargains.


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*Representatives in all the rubber centers of the United States, Canada, England, France, Germany and the Middle East.*

# *The Rubber Industry's* CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

## PRETTY-SCHEFFER FIRM LEASES ADMIRAL PLANT

The Pretty-Scheffer Rubber Company, Carrollton, O., has leased the factory buildings formerly occupied by the defunct Admiral Tire & Rubber Company at Coshocton, O. The Carrollton firm, which is to incorporate a new company for the operation of the Coshocton plant, will pay the taxes and keep the property in repair for a two-year period, after which it may purchase the building, land and machinery for $11,200.

The Pretty-Scheffer company is now manufacturing bathing caps, rubber gloves, hot water bottles and other drug store sundries at a small plant in Carrollton. It previously operated a larger plant at the same place, which was destroyed by fire in October, 1929, at a loss of $150,000.

The Admiral Tire & Rubber Company was originally formed in 1923 and was placed in receivership in December, 1929. It has since been in process of liquidation.

## AKRON RUBBER GROUP WILL MEET FEBRUARY 9

The next meeting of the members of the Akron Rubber Group of the American Chemical Society will be held at the Firestone Clubhouse, Akron, O., on Monday evening, February 9, at 7:45 p. m. Contrary to the usual custom of the group, dinner will not be served and no charge will be made for attendance at the meeting.

There will be presented three papers of exceptional interest. The subject of "Recovery of Rubber and Cotton from Uncured Tire Ply Scrap by an Extraction Process" will be treated by Charles S. Powell, of the Firestone Tire & Rubber Company. C. M. Carson, of the Goodyear Tire & Rubber Company, will present a paper on "Changes in Crude Rubber During Storage" and H. A. Brittain, also of Goodyear, will read a paper on "Drop Centre Tires and Rims."

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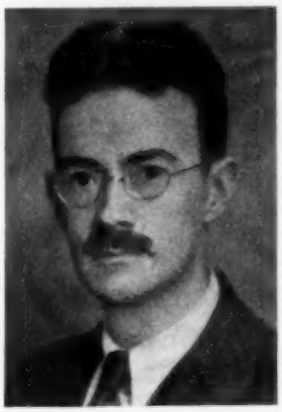
FRANK H. MASON, a director of the B. F. Goodrich Company, was guest of honor at a dinner given by JAMES D. TEW, company president, in the firm's executive dining room on December 29. The occasion marked both the 78th birthday of Mr. Mason and the 60th anniversary of the company. Mr. Mason himself has been with the Goodrich organization for 50 years, working his way up from the mill room to a directorship.

## Rubber Laboratory Head



E. P. W. Kearsley, who is now in charge of the rubber testing laboratory of the United Carbon Company at Charleston, W. Va. He has had considerable experience in rubber technology, including several years of work with the laboratories of the Fisk Rubber Company, where he was engaged in researches on the colloidal properties of pigments, with special reference to their dispersion in rubber and oil media. Mr. Kearsley obtained most of his education in England, later pursuing post graduate work at the University of Pennsylvania. He is well known in the rubber industry for his technical papers, especially those on the subject of sun cracking.

## To Foreclose on Houk Plant

Foreclosure proceedings against the Houk Rubber Company plant in Mooreville, O., between Dover and New Philadelphia, were filed January 8 in common pleas court by the Citizens National Bank of New Philadelphia, which claims $59,000 is due on a $79,000 loan at 7 per cent made in March, 1927. The factory, which includes 74 acres of land, was occupied successively by the Tuscora Rubber Company and the Monobloc Company, both of which failed.

## Southwark Name is Changed

The Southwark Foundry & Machine Company, manufacturer of power tools, hydraulic machinery and testing equipment, has transferred the major portion of its assets to the Baldwin-Southwark Corporation, which will carry on the business. The company was acquired several months ago by the Baldwin Locomotive Works and has moved from its old Philadelphia plant to new factory buildings at Eddystone, Pa.

## FORD CO. LOSES $30,000 IN L. ALBERT & SON SUIT

L. Albert & Son, Trenton, N. J., dealers in rubber mill machinery, have had an interlocutory judgment of $30,000 made final in Common Pleas Court in Hudson County against the Ford Motor Company, Detroit, Mich., for failing to deliver used rubber manufacturing machinery which the Trenton firm had purchased.

The plaintiffs testified that they contracted to purchase the machinery from the Ford company last February and that it was to be delivered from that company's plants at Detroit, Highland Park, River Rouge and St. Paul. It was alleged that the defendant company had made delivery of only a small part of the equipment sold and had put the remainder back in operation at their River Rouge or Dearborn plants.

Considerable expert testimony was used in the case by L. Albert & Son, including W. C. Hoover, former chief engineer of the B. F. Goodrich Company; Charles Venn, former president of the Century Tire & Rubber Company; and H. Walter Grote, technical superintendent of the Murray Rubber Company. Court orders were received to inspect the Ford plants at River Rouge, Highland Park, Minneapolis and St. Paul.

## XYLOS RUBBER COMPANY WINS SAFETY CONTEST

The Xylos Rubber Company has been announced winner in a safety contest conducted during the last six months between Akron plants of the Firestone Tire & Rubber Company. Xylos will be given a bronze plaque at a factory-wide safety meeting next month.

The best improvement shown in lost time accidents for the last half of 1930 compared to the first six months of the year was the basis of selecting the winners. Xylos led with a decrease of 54.36 per cent, Special Goods came second with a 48.76 reduction, and Plant No. 1 was third with a decrease of 48.07.

## General Tire Dividend

Directors of the General Tire & Rubber Company have declared a dividend of $1 a share, or four per cent, on the common stock of the company, payable February 1 to stockholders of record as of January 20. This is the 60th consecutive disbursement on this class of stock.

## $150,000 FIRE SWEEPS KILLIAN RUBBER PLANT

Two men were seriously burned when three chemical tanks exploded at the factory of the Killian Manufacturing Company, Akron, O., on January 15, causing a fire that swept through the plant with damage estimated at $150,000. Half of the factory, a two-story brick structure, was destroyed by the flames and explosion.

The plant employs 75 persons in the manufacture of drug sundries and rubber novelties. Fred T. Killian, president of the company, declared that plans for rebuilding the plant would be made at once.

## Spalding Earns $1,635,484

A. G. Spalding & Bros., manufacturer and distributor of sporting goods, including many rubber items, has reported for the year ended October 31, 1930, a net profit of $1,635,484 after depreciation, interest, federal taxes and other deductions. This compares with earnings of $2,050,446 in the previous year.

## Auxiliary Fisk Receivers

Circuit Judge John C. Kleczka has appointed Charles A. Dana, Bernardsville, N. J., manufacturer, and Roland W. Boyden, Boston, Mass., attorney, as auxiliary receivers for the Fisk Rubber Company in connection with its holdings at Cudahy, Wis. According to the petition filed at the court in Milwaukee, the Cudahy property is valued at $6,000,000. The same receivers also were appointed at Boston for the Massachusetts holdings of the company.

## Aetna Employes Organize

Employes of the Aetna Rubber Company, Ashtabula, O., organized the Aetna Rubber Employes Association at a meeting January 9. S. T. Campbell, president of the company, acted as chairman of the meeting and spoke briefly on company activities.

## Vanderbilt House Organ

The first issue of *The Vanderbilt News*, the new magazine of the rubber department of the R. T. Vanderbilt Company, 230 Park Avenue, New York City, has come off the press and presents a handsome appearance as the reproduction of the cover above indicates. As previously mentioned, the new magazine is edited by Dr. William Fraser Russell and is under the general supervision of Dr. A. A. Somerville as head of the Vanderbilt Company's rubber department. The first issue is devoted entirely to a description of Altax and an analysis of tests made with this benzothiazyl-disulfide accelerator.

## Roebling Buys N. J. Wire Cloth

The corporate existence of the New Jersey Wire Cloth Company was terminated on January 1, the business being continued by John A. Roebling's Sons Company, Trenton, N. J. The Roebling company has assumed all contracts and obligations of the New Jersey Wire Cloth Company, while the same personnel will continue the manufacture and sale of the entire line.

## Rubber Glider Makes Successful Flight

THE pneumatic rubber glider, designed by Taylor McDaniel, shown just after having completed a successful test flight at Hoover Field, Washington, D. C., with Joe Bergling at the controls. The others in the picture are William T. Grady, assistant builder, at the left and Mr. McDaniel. The construction of the glider, which is entirely of rubber tubing, was described in detail in THE RUBBER AGE of November 10, 1930.

## ECONOMIC SERVICE SEES BETTER YEAR FOR TRADE

The Brookmire Economic Service sees a better but not necessarily profitable year for the tire industry in its forecast of the 1931 situation. The latest bulletin of the service comments as follows on rubber:

"We are confident that the tire industry is facing a year of improved business in 1931, but we do not believe that the increase in operation schedules for the immediate future necessarily means that the industry will be operating on a profitable basis. Production of tires has been running below consumptive requirements in recent months and a demand is expected to occur next spring. Crude rubber prices have apparently made bottom, and inventory troubles are not anticipated for 1931."

## Pacific Goodrich Jumps Output

Production of the Pacific Goodrich Rubber Company, Los Angeles branch of the B. F. Goodrich Company, was scheduled to be raised from 20 to 25 per cent on January 1. A similar increase in output was put into effect on December 1, raising the production schedule at that time to 3,000 tires and 4,000 tubes daily.

## Form Latex Rubber Company

The Latex Rubber Company, Newark, O., has been incorporated for the manufacture of products from rubber and rubber derivatives. The company has been incorporated for $200,000, with L. W. Crandall and Alexander Crandall as incorporators. L. W. Crandall is head of the Burke Golf Company, Newark, O., manufacturer of golf balls, clubs and bags.

## Rubber Stocks Hold Firm

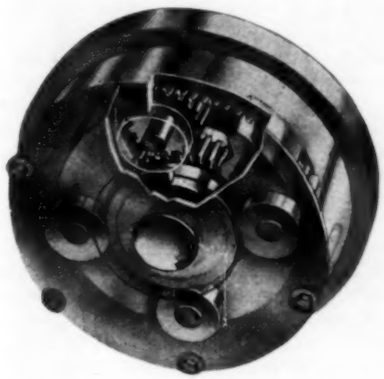
Securities of the leading rubber manufacturing companies showed little activity and no tendency either to advance or decline during the fortnight. Closing prices on January 20, as compared with the close of January 6 and with the high and low prices thus far in 1931, follow:

| | Last Price | | —1931— | |
|---|---|---|---|---|
| | Jan. 20 | Jan. 6 | High | Low |
| Aetna | — | — | 4 | 4 |
| Ajax | ⅝ | — | ½ | ⅝ |
| American Hard Rubber | — | — | — | — |
| Dayton "A" | — | — | — | — |
| Falls | — | — | — | — |
| Faultless | — | — | — | — |
| Firestone | — | — | 17½ | 17 |
| do. 6% pfd. | 58½ | 58⅜ | 60¼ | 58 |
| Fisk | ¾ | ½ | ¾ | ½ |
| do. 1st pfd. | 2½ | 2¼ | 2⅞ | 2¼ |
| General | 90 | — | 95 | 89½ |
| do. pfd. | — | — | 85½ | 83 |
| Goodrich | 16⅛ | 15⅜ | 16½ | 15½ |
| do. pfd. | — | — | 64 | 63 |
| Goodyear | 40½ | 40⅞ | 44½ | 39⅝ |
| do. 1st pfd. | — | 82 | 83¼ | 81½ |
| India | 9⅛ | — | 13 | 9⅛ |
| Intercontinental | — | 2⅝ | 3 | 2⅝ |
| Kelly-Springfield | — | 1⅝ | 1⅝ | 1⅝ |
| do. 6% pfd. | — | — | 35 | 28½ |
| Lee | — | 3¼ | 3⅝ | 3½ |
| Mohawk | 5 | — | 5½ | 5 |
| do. pfd. | — | — | — | — |
| Norwalk | — | — | ¾ | ⅝ |
| Pirelli | 34 | 32½ | 34⅛ | 34 |
| Raybestos-Manhattan | — | — | 21 | 19½ |
| Seiberling | — | 5 | 5⅜ | 5 |
| do. pfd. | 35 | 40 | 40 | 35 |
| U. S. Rubber | 12⅛ | 12¼ | 12⅞ | 11⅞ |
| do. pfd. | 24 | 23 | 25 | 23 |

# *New Equipment for Rubber Factories*

## Bronander Variable Speed Unit

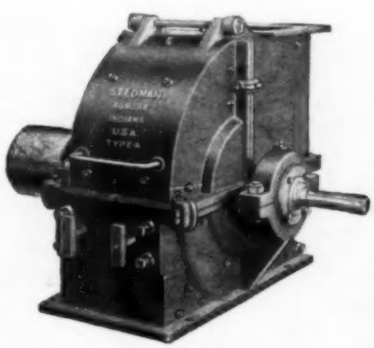
The Bronander variable speed unit, now being offered by the Spadone Machine Company, Inc., 15 Park Row, New York City, is a mechanical device capable of delivering from zero an infinite variety of speeds in



either direction. It is a smooth running positive drive made in sizes and rated according to the standard or conventional type speed transmissions to which it is directly attached. With the speed transmission running in one direction, the Bronander unit can be started from zero, in either direction, with a full load torque, and consequent slight loss of horsepower within its full speed range. Through the adjustment means of the constant running variable speed transmission, the Bronander unit may be brought to a stop, or the speed may be varied in either direction, without jumps, stops, or slippage. It is a self contained unit running in oil and is easily and quickly installed.

## Stedman Grinding Mill

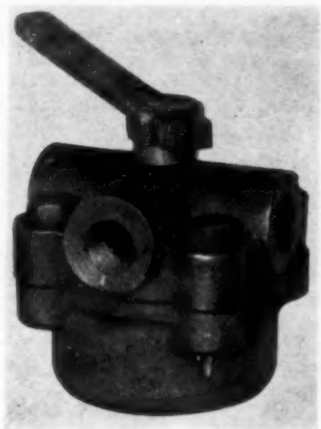
Stedman's Foundry & Machine Works, Aurora, Ind., is now offering swing ham-



mer mills in several types and sizes. The type "A" mill, which is illustrated above, is a general purpose machine, manufactured in nine sizes, and especially designed for fine and semi-fine grinding and pulverizing. All materials are reduced by the two-stage reduction method, in which the shattering is done in suspension. The finish grinding or sizing is accomplished after gravity has been overcome. This secondary reduction takes place between the face of an adjustable grinding plate and the hammer tips. This feature makes possible larger capacities, a more uniformly finished product and a reduction in maintenance cost.

## Nopak Air Operating Valves

The primary object of these Nopak valves is to provide valve equipment which will remain tight and leakless, not only in the closed position, but, likewise, in the operating position. The greatest loss of air or pressure usually results when the valve is in an operating position, due to leakage around the plug body and other parts. The principle on which these valves are con-

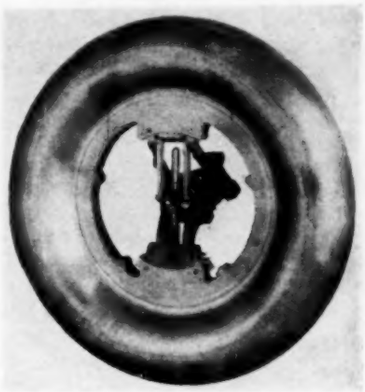


structed utilizes the pressure to assure a positive seal of valve parts. The pressure is at all times against the valve disc holding the lapped surface of the disc and valve body definitely sealed. The Style B, which is illustrated, is typical of the Nopak three and four way air operating valves for single and double acting cylinders. They have already been used successfully in several of the larger tire and rubber factories. The manufacturer is the Galland-Henning Manufacturing Company, 2763 South 31st Street, Milwaukee, Wis.

## Universal Type India Chuck

A new chuck adaptable to any size core has just been brought out by the India Machine & Rubber Mold Company, Akron, O. This chuck, illustrated herewith, has been adopted and is being successfully used in a number of the larger tire factories.

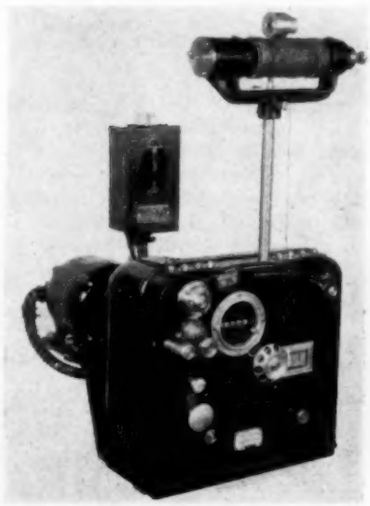
The development of this chuck was made necessary on account of the small diameter tires in use today. It can be used on all bead diameters from 16 inches up, thus eliminating the separate chucks which were formerly required for each core. The new chuck can be placed on the tire building machine and it can remain there permanently and be used for different size tires simply by changing the core sections. With this chuck



the core sections can be collapsed easily even in small bead diameter tires.

## Sibley-Pym Golf Ball Winder

The Sibley-Pym Corporation, Lynn, Mass., is introducing an improved automatic golf ball winding machine, identified as its Model B. The machine is of sturdy but simple construction, with all rotating parts mounted on ball bearings, and is equipped with an individual ¼ H.P. motor. A detector wheel engages the revolving ball and selects the low spots on the ball, presenting them in the path of the oncoming



thread. This great circle winding binds the ball together firmly, produces balls of a high degree of roundness and causes each circumference of rubber to be efficient in action. An operator requires no previous training and can operate several machines.

# Names in the News

H. P. PARKER, formerly of the color department of J. M. Huber, Inc., is now with the Ansbacher-Siegle Corporation, with offices at 50 Union Square, New York City, and laboratories at Rosebank, Staten Island, New York. Mr. Parker is in charge of the sales and rubber laboratory of the newly established rubber color division of that company. A complete line of colors suitable for use in rubber compounding will be offered to the trade very shortly.

HERBERT E. SMITH, vice-president of the United States Rubber Company, spent several days in Los Angeles at the beginning of the month as the guest of A. SCHLEICHER, president of the Samson Tire & Rubber Corporation. The final details of the acquisition of control of Samson by the United States Rubber Company were worked out during his visit.

COLONEL DAVID M. GOODRICH, chairman of the board of directors of the B. F. Goodrich Company, left a New York City hospital at the end of last month after being under observation for several days for a minor illness. CHARLES C. GOODRICH, his brother and a director of the company, was confined to the Deaconess Hospital, Brookline, Mass., for a week after becoming suddenly ill on a train en route from New York City to his home at York, Me., on December 30.

DR. L. B. SEBRELL, manager of the research department of the Goodyear Tire & Rubber Company, and DR. E. D. DIETERICH, of the physical laboratory research bureau at the B. F. Goodrich Company, together with several other members of their respective departments, attended the sessions of the American Association for the Advancement of Science at Cleveland during the first week in January.

E. B. BREWSTER, district manager at the St. Louis office of the Fisk Rubber Company, left that organization on January 3 to join the Johnson Motor Company, Waukegan, Ill., as assistant to COLONEL C. M. PIPER, vice-president in charge of sales and advertising. Colonel Piper left the Fisk Rubber Company several months ago to join the Johnson Motor Company.

DR. ENOCH KARRER, of the physical research department of the B. F. Goodrich Company, attended the sessions of the American Rheaology Society at Easton, Pa., on December 29.

F. G. STRETCH, of the Xylos Rubber Company, Ltd., has been chosen a member of the Manchester Section committee of the Institution of the Rubber Industry. The Birmingham Section committee for 1931 now includes among its members R. T. BROWN, L. R. MERNAGH and I. D. PATTERSON, all of the Goodyear Tyre & Rubber Company, Ltd.

## C. B. O'CONNOR TO HEAD GOODRICH TIRE SALES

C. B. O'Connor, former vice-president and general manager of Goodrich Silvertown, Inc., the retail division of the B. F. Goodrich Company, became general sales manager of the Goodrich tire division on January, according to an announcement by T. G. Graham, first vice-president of the Goodrich Company. After serving with the U. S. Army Tank Corps on the western front, Mr.

C. B. O'CONNOR

O'Connor joined the Goodrich sales organization and worked with the truck tire sales department of the New York branch, became branch manager at Newark, N. J., in 1922, and branch manager at Jacksonville, Fla., in 1925, being called to the Akron offices in August of the same year. He was also manager of the truck tire department.

J. P. WOODLOCK

J. P. Woodlock, former assistant manager of Goodrich Silvertown, Inc., succeeds Mr. O'Connor as head of this retail sales division.

RALPH K. GUINZBURG, president of the I. B. Kleinert Rubber Company, was reelected January 7 as president of the National Notion Association.

DR. ALBERTO PIRELLI, of the Pirelli Rubber Company, Milan, Italy, is chairman of a special committee of the International Chamber of Commerce to make an inquiry into the economic realtions between the United States and Europe, both directly between the two continents and in other markets. He will initiate a discussion of the committee's findings at the sessions of the International Chamber to be held in Washington, D. C., from May 4 to 9.

ROGER E. TURNER has returned to Columbus, O., to take charge of the central Ohio territory for the Dunlop Tire & Rubber Company. For the past few months he had been doing special work for the Dunlop organization in the Buffalo and New York City territories and before that was associated with the J. Jay Fuller advertising agency of Buffalo.

SUMNER F. SIMPSON, president of Raybestos-Manhattan, Inc., has been elected president of the Newfield Bank & Trust Company, Bridgeport, Conn.

ROBERT MCTAMMANY has been assigned to take charge of the central division of the tire department of the B. F. Goodrich Company. Other division assignments which became effective January 1 were: eastern, G. B. CAMPION; northwestern, A. C. KELLY; southwestern, F. E. MEURIN; and Pacific, F. E. TITUS. Headquarters for the eastern, central and northwestern divisions will be in Akron. Mr. Meurin will be located at Dallas, Tex., and Mr. Titus in Los Angeles, Cal. Other sales positions in the revised Goodrich organization include W. C. BEHOTEGUY, merchandise manager, tire division; H. J. LINTNER, sales analyst; E. LORENTZEN, sales research; and H. E. KELLER, manager subsidiary division.

J. A. HOUSE, a director of the Goodyear Tire & Rubber Company, has been elected to the Federal Advisory Council, Washington, D. C. He has been president of the Guardian Trust Company, Cleveland, O., for 14 years.

W. C. YOUNG, manager of the aeronautics department of the Goodyear Tire & Rubber Company, was the principal speaker at the annual meeting of the Chamber of Commerce of Ironton, O., held in the Hotel Marting in that city on January 13.

G. L. MATTHIAS, general superintendent of the mechanical goods division of the B. F. Goodrich Company, spoke before 250 of the company's executives and officials at a meeting in Akron on January 8. He discussed new developments in the Goodrich mechanical goods division.

W. D. JOHNSON has been appointed merchandising director of the Firestone Tire & Rubber Company of California, with headquarters at the factory at Los Angeles.

HARRY CASE, of the Hamilton Rubber Company, Trenton, N. J., and BEVIS LONGSTRETH, president of the Thiokol Corporation, Yardville, N. J., recently gave talks on "Rubber Production" before the Trenton Chamber of Commerce.

HORACE T. COOK, president of the Acme Rubber Company and the Hamilton Rubber Company, Trenton, N. J., is spending the winter with his family at Mountain Lakes, Fla.

HOLLAND B. SLUSSER, vice-president and treasurer of the Pocono Rubber Cloth Company, Trenton, N. J., is a candidate for re-election to the board of education at Princeton, N. J.

WILLIAM E. DUCK, managing director of the Firestone Tyre & Rubber Company factory at Brentford, England, spent the week of January 12 conferring with officials of the parent company at Akron. He reported Firestone business in England as excellent, stating that the plant has been operating on a 24-hour day basis since it opened two years ago.

HUGH ALLEN, publications manager of the Goodyear Tire & Rubber Company, was the author of an article entitled "Dirigible" in the December issue of *Westrn Flying* in which he points out the safety of lighter than air craft.

DONALD W. SMITH, American trade commissioner under the Department of Commerce at Singapore, was a visitor to Akron last month. He stated that in his opinion rubber growing was receding in Malaya so that scores of smaller estates will be permitted to grow up in jungle.

J. R. HANSEN has been transferred from the Detroit factory of the United States Rubber Company to the Passaic, N. J., plant, where he will act as supervisor of safety. Mr. Hansen is secretary of the Rubber Section of the National Safety Council.

V. I. MONTENYOHL, treasurer of the B. F. Goodrich Company, spoke before 200 members of the company's management group last month at the Akron City Club. He talked on sales, service and credits.

FREDERICK R. SAYEN, president of the Mercer Rubber Company, Trenton, N. J., recently gave a talk on the rubber industry in Trenton before the members of the Trenton Chamber of Commerce.

HARVEY S. FIRESTONE, president of the Firestone Tire & Rubber Company, arrived at his winter home at Miami Beach, Fla., late last month, together with Mrs. Firestone and other members of his family. They will remain there until March.

# Crude Rubber Items

## FIRESTONE DEMANDS END TO SLAVERY IN LIBERIA

The report of the International Committee on Forced Labor in Liberia, officially released on January 10, disclosed conditions of actual slavery in certain sections of the country, but absolved the Firestone Plantations Company of consciously using any but voluntary labor. Before the report was published in full, President King and Vice-President Yancy of Liberia both resigned.

Harvey S. Firestone, Jr., president of the Firestone Plantations Company, has written to Henry L. Stimson, Secretary of State, urging that the United States take whatever steps possible to correct such conditions. "As you know," he said, "the existence of such conditions has been a source of grave concern to us and has interfered with our obtaining free labor, upon which we insisted from the first day we went into Liberia."

## ESTATE WORKERS OFFER UNEMPLOYMENT PROBLEM

Thus far the unemployment problem in Malaya rubber centres has been well handled by the Government and by the committees which have been formed at every centre of importance in the Peninsula, and so far the matter is being dealt with efficiently. Indian and Chinese unemployment has so far been met by repatriation of the men thrown out of work to their respective countries, and the restriction on immigration imposed by the Government has proved an effective measure.

The worst of the trouble, however, has not been reached, and, serious as it now is, may yet put a heavy strain on the country. The problem of unemployed Europeans in the next three months is one which may tax the ingenuity of the committees and the resources of the country severely unless employers decide to retain the services of such men who have served them efficiently in the past but temporarily are superfluous in the present crisis.

With any recovery of the markets these men will be needed. Skilled in their professions, trained to handle men in the East, and speaking the languages of their labour forces, they are assets to the country.

## RUBBER ESTATES CURTAIL THEIR 1931 PRODUCTION

Several rubber producing companies recently issued statements on tapping policy. The directors of the East Asiatic Rubber Estates (comprising 11,109 acres planted, of which 10,620 acres are mature rubber) have adopted a modified system of tapping, under which the output during 1931 will be curtailed by approximately 1,000,000 lb.

The Mount Austin (Johore) Rubber Estates, whose total planted area comprises 11,503 acres (of which 10,772 acres are mature), have also adopted a similar restricted system of tapping, under which the output during 1931 will be reduced by approximately 1,200,000 lb.

The policy adopted by the two companies, it is stated, aims at a conservation of bark and amelioration of the general position by reduction of the quantity of rubber placed upon the market.

For 1931 the directors of F. M. S. Rubber Planters Estates and the Mambau (F. M. S.) Rubber Co. have decided to adopt a tapping policy by which the potential output will be reduced by approximately 500,000 lb. and 100,000 lb. respectively.

## *Closing Prices on Rubber Exchange of New York, Inc.*

FROM JANUARY 5 TO JANUARY 19, 1931

| | | Spot | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Sales |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No. 1 Standard Contract of 10 Tons** | | | | | | | | | | | | | | | |
| Jan. | 5 | 8.45 | 8.40 | 8.45 | 8.65 | 8.72 | 8.80 | 8.91 | 9.02 | 9.12 | 9.22 | 9.35 | 9.48 | 9.61 | 27 |
| | 6 | 8.31 | 8.22 | 8.32 | 8.45 | 8.55 | 8.65 | 8.76 | 8.90 | 8.98 | 9.05 | 9.18 | 9.31 | 9.44 | 1 |
| | 7 | 8.25 | 8.25 | 8.35 | 8.45 | 8.55 | 8.65 | 8.75 | 8.83 | 8.92 | 9.00 | 9.15 | 9.28 | 9.41 | 28 |
| | 8 | 8.31 | 8.25 | 8.35 | 8.47 | 8.58 | 8.70 | 8.77 | 8.85 | 8.95 | 9.03 | 9.18 | 9.30 | 9.40 | 9 |
| | 9 | 8.50 | 8.45 | 8.56 | 8.67 | 8.76 | 8.85 | 8.96 | 9.07 | 9.17 | 9.28 | 9.35 | 9.47 | 9.59 | 26 |
| | 10 | 8.50 | 8.45 | 8.55 | 8.64 | 8.74 | 8.84 | 8.94 | 9.04 | 9.12 | 9.20 | 9.33 | 9.45 | 9.57 | 15 |
| | 12 | 8.56 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.00 | 9.10 | 9.18 | 9.25 | 9.38 | 9.50 | 9.62 | 13 |
| | 13 | 8.56 | 8.50 | 8.58 | 8.66 | 8.75 | 8.85 | 8.95 | 9.05 | 9.13 | 9.20 | 9.33 | 9.45 | 9.55 | 10 |
| | 14 | 8.56 | 8.50 | 8.59 | 8.67 | 8.76 | 8.85 | 8.95 | 9.05 | 9.15 | 9.25 | 9.38 | 9.49 | 9.59 | 8 |
| | 15 | 8.43 | 8.35 | 8.38 | 8.42 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.00 | 9.15 | 9.26 | 9.36 | 29 |
| | 16 | 8.31 | 8.25 | 8.33 | 8.40 | 8.49 | 8.58 | 8.68 | 8.77 | 8.87 | 8.97 | 9.08 | 9.19 | 9.30 | 8 |
| | 17 | 8.31 | 8.25 | 8.33 | 8.40 | 8.49 | 8.58 | 8.68 | 8.77 | 8.87 | 8.97 | 9.08 | 9.19 | 9.30 | 2 |
| | 19 | 8.10 | 8.05 | 8.15 | 8.25 | 8.35 | 8.45 | 8.55 | 8.65 | 8.75 | 8.85 | 8.96 | 9.07 | 9.18 | 57 |
| **Old 'A" Contract of 2½ Tons** | | | | | | | | | | | | | | | |
| Jan. | 5 | —— | 8.40 | 8.40 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.00 | 9.10 | 9.20 | 9.40 | 9.50 | 20 |
| | 6 | —— | 8.20 | 8.30 | 8.40 | 8.50 | 8.60 | 8.60 | 8.70 | 8.80 | 8.90 | 9.10 | 9.20 | 9.30 | 17 |
| | 7 | —— | 8.20 | 8.30 | 8.30 | 8.40 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.10 | 9.20 | 9.30 | 18 |
| | 8 | —— | 8.20 | 8.30 | 8.30 | 8.40 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.10 | 9.20 | 9.30 | 68 |
| | 9 | —— | 8.40 | 8.50 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.00 | 9.10 | 9.30 | 9.40 | 9.50 | 3 |
| | 10 | —— | 8.40 | 8.50 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.00 | 9.10 | 9.30 | 9.40 | 9.50 | 24 |
| | 12 | —— | 8.50 | 8.60 | 8.60 | 8.70 | 8.80 | 8.90 | 9.00 | 9.00 | 9.10 | 9.30 | 9.40 | 9.50 | 16 |
| | 13 | —— | 8.50 | 8.50 | 8.60 | 8.70 | 8.80 | 8.80 | 8.90 | 9.00 | 9.10 | 9.30 | 9.40 | 9.50 | 91 |
| | 14 | —— | 8.50 | 8.50 | 8.60 | 8.70 | 8.80 | 8.80 | 8.90 | 9.00 | 9.10 | 9.30 | 9.40 | 9.50 | 25 |
| | 15 | —— | 8.30 | 8.30 | 8.30 | 8.40 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.10 | 9.20 | 9.30 | 76 |
| | 16 | —— | 8.20 | 8.20 | 8.30 | 8.40 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.00 | 9.10 | 9.20 | 9 |
| | 17 | —— | 8.20 | 8.20 | 8.30 | 8.40 | 8.50 | 8.60 | 8.70 | 8.80 | 8.90 | 9.00 | 9.10 | 9.20 | 9 |
| | 19 | —— | 8.00 | 8.00 | 8.10 | 8.30 | 8.40 | 8.40 | 8.50 | 8.60 | 8.70 | 8.90 | 9.00 | 9.10 | 49 |

# Rubber News Around the World

## FIRESTONE OF ARGENTINA PLANT WILL OPEN IN MAY

The Firestone Tire & Rubber Company's new tire factory in the Argentine will be in production by May 1, 1931. The plant is located at Llavallol, near Buenos Aires, and will have a capacity of 1,000 tires and tubes daily. It will be operated by the recently formed Argentine Company "Firestone de la Argentine, S. A."

Officers of the new South American plant are Harvey S. Firestone, Sr., chairman of the board of directors; Harvey S. Firestone, Jr., president; E. C. Shule and Samuel Broers, vice-presidents and James A. Wilkinson, secretary and treasurer.

The plant will be over 800 feet long, of the latest type and will embody all of the modern methods developed by Firestone engineers. Raw materials will come into one end of the factory and finished tires, inspected and wrapped, will emerge from the other. Experience gained from building the Firestone tire factories in Los Angeles and Brentford, England, led to this type of construction.

The factory is exceedingly well located, from the standpoint of labor supply and transportation, availability of power and water supply. The site has a frontage of 1,300 feet on the main paved highway leading to Buenos Aires from Eccheverrea, is approximately 1,900 feet deep and covers sixty acres. The main line of the Southern Railroad, one of the most important railroads in the Argentine, adjoins the north side of the property.

## RUBBER INSTITUTION TO HOLD SEVERAL MEETINGS

Members of the London and District Section of the Institution of the Rubber Industry will meet February 2 at the Arts Theatre Club, London, to hear C. W. Shacklock present "A Review of the Contributions of X-ray to Rubber." On February 6, the West of England Section will assemble at Trowbridge to listen to a paper by Dr. D. F. Twiss on "Impurities of Importance to the Rubber Industry."

The Manchester Section will hold a joint meeting with other societies on February 6 at the Engineers' Club in that city. A. Fraser will present a paper on "Plant Used in the Manufacture of Synthetic Rubber," and a special paper will be read by a technical representative of the British Dyestuffs Corporation. There will be a meeting of the Midland Section on February 10 at the Grand Hotel, Leicester, at which S. G. Ball will speak on "The Manufacture and Use of Rubber Goods in the Far East."

SIR WILLIAM LETTS, chairman of the Fisk Tyre Company, Ltd., British affiliate of the Fisk Rubber Company, has resigned his position both as chairman and as director.

## Dominion Rubber to Expand

The Dominion Rubber Company, Ltd., is receiving bids for the construction of an addition to its factory. The cost of the new addition is estimated at $100,000.

## November Golf Ball Imports

Imports of golf balls into the United States during November, 1930, numbered 78,240, valued at $25,536. This compares with imports of 61,078 balls, worth $20,528, in October and with imports of 43,072 balls, valued at $13,901, in November, 1929. The unit value per ball in November, 1930, was 32.7 cents as compared to 33.5 cents in October and 33.7 cents in September.

## STEDFAST RUBBER WILL OPEN CANADIAN FACTORY

The Stedfast Rubber Company, of Boston and North Easton, Mass., is making arangements to open a new plant in Granby, Que. From this factory, the company will serve the Canadian trade with a complete line of Kafsted quarter lining material, Stedfast fabric for reinforcing and plumping leather, and also backing cloth, cover cloth and sock lining.

The company's Canadian business has risen steadily in recent years, making this step necessary.

## DUTCH FOOTWEAR IMPORTS REACH NEW PEAK IN 1930

Imports of rubber footwear into the Netherlands, which have increased steadily during recent years, reached a new high point in 1930 of probably 2,000,000 pairs, even though retrenchment has prevailed in most world markets. This important market, however, is one in which American and Canadian exporters participate but little. The leading suppliers of this trade are Belgium, Germany and the United Kingdom, with German exports expanding at a rapid rate in recent years.

France, formerly an important source for rubber footwear, almost dropped out of the competition in 1929, but came back to lead the United States and Canada in 1930. Czechoslovakia and Poland and Danzig enter into the trade at intervals with good-sized shipments, the greatest strength of Poland being shown in 1930.

Every exporting country shared in the trade expansion of 1930, but Belgium and Germany continued to furnish practically three-fourths of the entire trade. The exports of the United States, combined with those of Canada, were at the bottom of the list. No tariff preferences are accorded any country exporting to the Netherlands, and price is, therefore, the chief consideration in competing with the cheaper product of Belgium and Germany.

# Various Drug Sundries Find A Market in United Kingdom

THERE is a steadily increasing market for drug sundries of various types and of all price ranges in the United Kingdom. Rubber hot water bottles, it need hardly be stated, have a large winter sale, and they are heavily advertised by all drug and department stores. The better quality bottles appear to be the products of English manufacturers, prices retail ranging from 4s. (97 cents) for a 10-inch by 6-inch seamed rubber bottle to 6s. 9d. ($1.64) or over for 12 inches by 10 inches of similar type. Retailers report a large turnover in moulded seamless bottles, some of which are imported. Average small prices are about 2s. 6d. (60 cents) retail each. Wholesalers state that a seamless bottle to be competitive must be delivered to wholesaler at about 1s. 4d. (32 cents (each) or 16s. ($3.89) per dozen. Novelty bottles with animal design covered in plush and woolley materials range from 36s. ($8.75) to 40s. ($9.73) per dozen wholesale for the 10-inch by 8-inch size.

### Rubber Gloves Selling Well

Household rubber gloves are receiving a good sale. According to United Kingdom statistics, imports from the United States in 1929 were 36,641 dozen pairs (£18,263) and from Germany 11,760 dozen pairs (£5,382), while in 1928 imports from the United States amounted to 31,312 dozen pairs (£16,893) and from Germany 24,173 dozen pairs (£7,871). Cheap varieties are being sold in 15-cent stores at 6d. (12 cents) per glove, while drug and departmental stores offer gloves at 1s. 6d. (36 cents) per pair for light rubber, and 3s. 6d. (85 cents) per pair for better quality. Surgical rubber gloves in smooth finish are quoted by one English manufacturer to wholesalers at 27s. ($6.56) and in rough finish at 30s. ($7.29) per dozen pairs. The above prices by no means comprise what is being quoted on this market, but may be taken as illustrative of the general level of prices.

### Variety Stores a Good Market

Other articles which are finding a fair sale in the 15-cent store trade and departmental stores are rubber sponges, small rubber hoods and capes in pastel shades, frilled rubber aprons, and rubber toys. Retail prices vary for each of these articles from 6d. (12 cents) upwards. The United States, Germany, France, and Sweden are the major sources of supply for rubber toys.

## RUBBER CONGRESS TO BE HELD IN PARIS IN MAY

The Syndicat du Caoutchouc has organized a technical rubber congress to be held on the occasion of the opening of the International Colonial Exposition in Paris toward the end of May. Papers dealing with the chemistry and manufacture of rubber will be read and discussed, and the Institution of the Rubber Industry of Great Britain and the German Society of Rubber Chemists and Engineers have agreed to participate.

M. Fric is in charge of matters dealing with the general chemistry of rubber section and M. Paul Bary is in charge of the conferences on colloidal chemistry. The definite date for the rubber conference has not yet been decided upon.

## VISIT TO ENGLAND IS POSTPONED UNTIL 1933

The proposed visit to England of members of the Rubber Division of the American Chemical Society for a joint conference with the members of the Institution of the Rubber Industry has been postponed until 1933. It had previously been scheduled for either May or June, 1931.

The invitation of the I. R. I. for American rubber technologists to attend a joint conference was accepted by the Rubber Division, A. C. S., last March. At the time, J. M. Bierer was appointed chairman of a sub-committee to make all arrangements, the other members being R. P. Dinsmore and A. A. Somerville.

### American Eraser Trade Grows

The United States supplies practically the whole world with rubber bands and erasers, and this trade has grown tremendously in recent years. In 1926 exports of these articles amounted to only 3,647 pounds, but by 1929 domestic manufacturers shipped 1,067,345 pounds. The United Kingdom remains the best customer for these items.

### Goodrich Safety Contest

The workers of the Miller Rubber Products Company, Inc., and the Philadelphia Rubber Works Company will compete with those of divisions of the B. F. Goodrich Company in the two six-month safety contests of 1931, according to Walter L. Schneider, safety engineer. A new trophy will be offered in place of the one to be awarded January 26 to the tire division for the best record in the last two and a half years. The tire division won permanent possession of the trophy by leading in three contests.

### *Ezra D. Davidson*

Ezra D. Davidson, rubber machinery sales engineer of the Farrel-Birmingham Company, Inc., Ansonia, Conn., died at his home in that city on December 30, after an illness that had its inception last April. He was well known in the rubber industry, especially in New England, New York, New Jersey and other parts of the East.

Born in Ansonia on December 5, 1886, Mr. Davidson was educated in that city's schools, leaving the high school to enter the plant of the old Farrel Foundry & Machine Company. He spent 29 years with the Farrel and Farrel-Birmingham companies. In

earlier years, Mr. Davidson was a member of the championship team of the Farrel foundry in the old Industrial Basketball League.

Funeral services were held January 2, the honorary pallbearers including Franklin Farrel, Jr., Nelson W. Pickering, Alton Farrel, D. R. Bowen, Franklin R. Hoadley, Carl Hitchcock, Carol E. Burton and Emil H. Berges. The active bearers were David Milne, Edwin L. Lyon, Philip V. Tippet, Carl F. Schnuck, John E. Walters and Albert C. Seaton.

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### Examinations for Assistant Scientific Aide Under Scientific Helper

The United States Civil Service Commission announces that open competitive examinations for Assistant Scientific Aides and Under Scientific Helpers will be held shortly to fill vacancies in various cotton and rubber investigations in the Southern States, now being conducted by the Bureau of Plant Industry, Department of Agriculture. Applications can be secured from the Civil Service Commission, Washington, D. C., and must be filled out and returned not later than February 24, 1931.

The entrance salaries for assistant scientific aide range from $1,620 to $1,980 a year, and for under scientific helper from $1,260 to $1,620 a year.

Competitors will be rated on practical questions relative to the duties of the position, and also on their education, training, and experience.

Completion of at least one year of study in a college or university of recognized standing, and two years of experience in laboratory or field work with cotton, rubber, or other tropical plants, or completion of three years of suitable experience, one year of which must have been directly in line with the duties of the position, are required for the position of assistant scientific aide.

For the position of under scientific helper, applicants must have had at least one year of practical experience in connection with agricultural experimental work in the laboratory or in the field; provided, that the completion of one or more standard high-school courses in science will be accepted in lieu of the required experience.

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# LATE MARKET PRICES

## RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, JANUARY 20, 1931

# RUBBER

## Crude

DURING the fortnight the price of crude rubber has remained practically stationary, declining fractionally in the case of few grades. The daily closing price for ribbed smoked sheets at New York rose to 8⅝ cents early in the period on news of the increased activity at Akron tire factories, but fell back and closed on January 20 at 8¼ cents after the publication of the low consumption report for December and the tremendous rise of domestic stocks to a new peak.

There continue to be evidences of curtailment of production on eastern estates, but it still remains a question whether output of the crude commodity will be brought down to the level of world consumption this year. Manufacturers, however, are now purchasing crude rubber, and brokers are advising the speculative purchase of future commitments on any appreciable setbacks. The foreign markets have also been more active following the holiday season.

Prices quoted on the New York outside market at the close on January 20 were as follows:

| | | | |
|---|---|---|---|
| ***Plantations—*** | | | |
| **Ribbed Smoked Sheets—** | | | |
| Spot-Jan. | .08 | @ | .08¼ |
| Jan.-Mar. | .08 | @ | .08⅜ |
| Apr.-June | .08⅜ | @ | .08⅝ |
| First Latex, crepe spot | .08¼ | @ | .08⅝ |
| Amber Crepe, No. 2 | .07⅝ | @ | .07⅞ |
| Amber Crepe, No. 3 | .07⅜ | @ | .07⅝ |
| Amber Crepe, No. 4 | .07¼ | @ | .07½ |
| Brown Crepe, Clean thin | .07⅜ | @ | .07⅝ |
| Brown Crepe, specky | .07¼ | @ | .07⅜ |
| **Liquid Latex, per gal.** | **.75** | **@** | **.85** |
| ***Paras—*** | | | |
| Up-river, fine | 11.¼ | @ | — |
| **Up-river Medium** | **Nominal** | | |
| Up-river Coarse | .07 | @ | .08 |
| Acre Bolivian, fine | .11½ | @ | — |
| Caucho Ball, Upper | .07 | @ | .08 |
| **Islands, fine** | **Nominal** | | |
| ***Centrals—*** | | | |
| **Central, scrap** | — | **@** | **.07** |
| **Esmeraldas** | — | **@** | **.07** |
| ***Balata—*** | | | |
| **Block, Colombia** | **Nominal** | | |
| Block, Ciudad | .31 | @ | .31½ |

### LONDON MARKET

| | | | |
|---|---|---|---|
| **Standard Ribbed Smoked Sheets—Buyers** | | | |
| Spot-Jan. | | @ | 4⅛d |
| Jan.-Mar. | 4⅛ | @ | 4¼d |
| Apr.-June | | @ | 4¼d |

### SINGAPORE MARKET

| | | | |
|---|---|---|---|
| **Standard Ribbed Smoked Sheets—Sellers** | | | |
| Spot | | @ | 3⅝d |

## Scrap

Scrap dealers have noted an increase in demand following the pick-up in tire factory activity with its consequent impetus to the production and consumption of reclaim. Prices still remain at extremely low levels and collections are difficult. Late quotations for the various grades of scrap rubber were as follows:

| (Prices to Consumer) | | | | |
|---|---|---|---|---|
| Auto tire peelings | ton | 23.50 | @ | 25.00 |
| Mixed auto | ton | 12.00 | @ | 12.50 |
| Bicycle tires | ton | 9.00 | @ | 10.00 |
| Clean solid truck tires | ton | 24.50 | @ | 26.00 |
| Boots and shoes | cwt. | 1.10 | @ | 1.25 |
| Arctics, untrimmed | cwt. | .90 | @ | 1.00 |
| Inner tubes, No. 1 | lb. | .05¼ | @ | .05½ |
| Inner tubes, No. 2, compounded | lb. | .02⅛ | @ | .02¼ |
| Inner Tubes, Red | lb. | .02¼ | @ | .02⅜ |
| Air Brake Hose | ton | 10.00 | @ | 12.00 |
| Rubber Hose | ton | 9.00 | @ | 10.00 |

## Reclaimed

Consumption of reclaimed rubber slumped to the lowest level in years during December, but has increased appreciably this month due to the spurt in tire factory operations. Prices for the various grades have remained practically unchanged during the fortnight, as have the quotations for the crude commodity. The latest prices follow:

| | | | | |
|---|---|---|---|---|
| ***High Tensile*** | | | | |
| Super-Reclaim Black | lb. | .08½ | @ | .08¾ |
| High Tensile Red | lb. | .08¼ | @ | .08⅜ |
| ***Shoe*** | | | | |
| Unwashed | lb. | .06 | @ | .06¼ |
| Washed | lb. | .08 | @ | .08¼ |
| ***Tube*** | | | | |
| No. 1 (Floating) | lb. | .08½ | @ | .08¾ |
| No. 2 (Compounded) | lb. | .07½ | @ | .07¾ |
| ***Tires*** | | | | |
| Black | lb. | .05¾ | @ | .06 |
| Black, selected tires | lb. | .06 | @ | .06⅛ |
| Dark Gray | lb. | .07 | @ | .07⅛ |
| Light Gray | lb. | .07⅜ | @ | .08 |
| White | lb. | .08¾ | @ | .09 |
| Truck, Heavy Gravity | lb. | .06 | @ | .06¼ |
| Truck, Light Gravity | lb. | .06¼ | @ | .06⅛ |
| ***Miscellaneous*** | | | | |
| Mechanical blends | lb. | .05 | @ | .05⅛ |

# COTTON and FABRICS

## Cotton

THE closing price for middling upland cotton on the New York market has varied during the fortnight between 10.00 and 10.30 cents a pound. On January 20 it closed at 10.20 cents as compared to 10.15 cents on January 4.

The important factors bearing on the commodity continue along the same general trend as in recent months, no fundamental changes being apparent in the last two weeks. The demand still fails to improve, while the supply remains large. Foreign markets are weaker than our own, due in some measure to the efforts toward price stabilization made by the Farm Board.

The high, low and closing prices for the commodity on the New York Cotton Exchange on January 20 were as follows:

| | High | Low | Close Jan. 20 | Close Jan. 6 |
|---|---|---|---|---|
| Jan. | 10.10 | 9.98 | 10.10 | 9.94 |
| **Mar.** | **10.29** | **10.10** | **10.26** | **10.14** |
| May | 10.54 | 10.35 | 10.53 | 10.41 |

## Tire Fabrics

The consumption of cotton fabric in the production of tires and tubes during November amounted to 10,522,306 pounds, according to the Rubber Manufacturers' Association. Consumption in December was, of course, lower, but it is expected that the present month will show an appreciable increase. Late prices follow:

| | | | | |
|---|---|---|---|---|
| **CORD** | | | | |
| Peeler, carded, 28/4/3 | lb. | .34½ | @ | .34¾ |
| Peeler, carded, 23/5/3 | lb. | .33 | @ | .33¼ |
| Peeler, carded, 13/3/3 | lb. | .30½ | @ | .30¾ |
| Peeler, carded, 15/3/3 | lb. | .31 | @ | .31¼ |
| Egyptian, carded, 23/5/3 | lb. | .43 | @ | .43¼ |
| Egyptian, combed, 23/5/3 | lb. | .47 | @ | .47½ |
| **CHAFERS** | | | | |
| Carded, American, 8 oz. | lb. | .26½ | @ | .27 |
| Carded, American, 10 oz. | lb. | .26 | @ | .26½ |
| Carded, American, 12 oz. | lb. | .25½ | @ | .26¼ |
| Carded, American, 14 oz. | lb. | .25 | @ | .26 |
| **LENO BREAKER** | | | | |
| Carded, American, 8¼ oz. | lb. | .26 | @ | .32 |
| Carded, American, 10¼ oz. | lb. | .26 | @ | .32 |
| **SQUARE WOVEN** | | | | |
| Carded, American, 17¼ oz. 23-11 ply | lb. | .33 | @ | .33½ |
| Carded, American, 17¼ oz. 10-ply | lb. | .25 | @ | .25½ |

## Sheetings

The sheetings market was practically unchanged after the past fortnight, although some grades declined fractionally. The latest quotations, as quoted by the Textile Brokers Association, were as follows:

| | | | | |
|---|---|---|---|---|
| 40-inch, 2.50-yard | yd. | — | @ | .07¾ |
| 40-inch, 2.85-yard | yd. | — | @ | .06¾ |
| 40-inch, 3.15-yard | yd. | — | @ | .07½ |
| 40-inch, 3.60-yard | yd. | .06½ | @ | .06⅝ |
| 40-inch, 3.75-yard | yd. | — | @ | .05¾ |
| 40-inch, 4.25-yard | yd. | — | @ | .05⅛ |

## Ducks

The various grades of cotton ducks used in the rubber industry remained firm in price during the last two weeks. Even at the present low levels, however, little business is reported. The current quotations follow:

| | | | | |
|---|---|---|---|---|
| Belting and Hose | lb. | — | @ | .24 |
| Enameling | lb. | .22 | @ | .24 |
| Single filling | lb. | .10¾ | @ | .12 |
| Double filling | lb. | .13 | @ | .14 |

# CHEMICALS

THE reduction of a half-cent in the price quotations on carbon black made on December 26 has caused somewhat more activity in buying by the leading tire and rubber manufacturing companies. The resumption of five-day week schedules with longer hours in some of the largest plants has also contributed to an increase in the consumption of this important compounding material. The price range and general demand in the case of other rubber chemicals and compounding ingredients has remained practically unchanged in the fortnight. New accelerators, introduced by two of the leading rubber chemical houses, have met with favorable receptions.

## ACCELERATORS

| | | | |
|---|---|---|---|
| **Organic** | | | |
| A-1 | lb. | .24 @ | .27 |
| A-5-10 | lb. | .33 @ | .36 |
| A-7 | lb. | .55 @ | .59 |
| A-11 | lb. | .62 @ | .66 |
| A-16 | lb. | .57 @ | .61 |
| A-19 | lb. | .58 @ | .62 |
| A-20 | lb. | .64 @ | .68 |
| A-32 | lb. | .80 @ | .95 |
| Aldehyde ammonia, crystals | lb. | .65 @ | .70 |
| Aniline oil, drums, f.o.b. works | lb. | .15 @ | .16 |
| Captax | lb. | | |
| Crylene | lb. | .55 @ | .65 |
| paste | lb. | .45 @ | .55 |
| Di-Ortho-Tolyguanidine | lb. | .42 @ | .44½ |
| Diphenylguanidine | lb. | .30 @ | .32½ |
| Ethylidene aniline | lb. | .45 @ | .47½ |
| Formaldehyde aniline | lb. | .37½@ | .40 |
| Heptene | lb. | .40 @ | — |
| Hexamethylene-tetramine | lb. | .58½@ | .61 |
| Lithex | lb. | .18 @ | .20 |
| Methylenedianiline | lb. | .37½@ | .40 |
| Monex | lb. | 3.25 @ | — |
| Oxynone | lb. | .68 @ | .80 |
| Phenex | lb. | .75 @ | — |
| Pipsol | lb. | 4.30 @ | 4.50 |
| R & H 40 | lb. | .40 @ | .42½ |
| R & H 50 | lb. | .40 @ | .42½ |
| R & H 397 | lb. | .75 @ | .77½ |
| R-2 | lb. | 1.95 @ | 2.15 |
| Safex | lb. | 1.20 @ | 1.25 |
| SPDX | lb. | .75 @ | — |
| Super-Sulphur No. 1 | lb. | | |
| No. 2 | lb. | | |
| Tensilac, No. 39 | lb. | .40 @ | .42½ |
| Tensilac, No. 41 | lb. | .50 @ | .52½ |
| Thermio F | lb. | .50 @ | .55 |
| Thiocarbanilid, drums | lb. | .25½@ | .28½ |
| Trimene | lb. | .75 @ | — |
| base | lb. | 1.20 @ | — |
| Triphenylguanidine | lb. | .58 @ | .62½ |
| Tuads | lb. | | |
| Ureka | lb. | .75 @ | 1.00 |
| Vulcanex | lb. | | |
| Vulcone | lb. | | |
| Vulcanol | lb. | | |
| Z-88-P | lb. | .50 @ | .60 |
| Zimate | lb. | | |
| **Inorganic** | | | |
| Lead, sublimed blue | lb. | .08¼@ | — |
| Lead, white | lb. | .08½@ | .08¾ |
| Litharge, domestic | lb. | .07¾@ | — |
| Magnesia, calcined, light | per 100 lb. | 5.35 @ | 5.45 |
| heavy | per 100 lb. | 3.65 @ | 3.75 |

## COLORS

| | | | |
|---|---|---|---|
| Blacks (See Compounding Materials) | | | |
| Blues | | | |
| Prussian | lb. | .35 @ | .36 |
| Ultramarine | lb. | .06 @ | .32 |
| Browns | | | |
| Sienna, Italian | lb. | .05½@ | .12½ |
| Umber, Turkey | lb. | .04½@ | .07 |
| Greens | | | |
| Chrome, light | lb. | .30 @ | .32 |
| medium | lb. | .31 @ | .33 |
| dark | lb. | .34 @ | .36 |
| Chromium Oxide, bbl. | lb. | .34½@ | .35½ |
| Reds | | | |
| Antimony crimson, 15/17 | lb. | .40 @ | .44 |
| sulfur, free | lb. | .56 @ | .66 |
| golden, 15/17 F.S. | lb. | .20 @ | .25 |
| Indian English | lb. | .08 @ | .11 |
| Domestic (Maroon) | lb. | .11 @ | — |
| Oximony | lb. | .13¼@ | — |
| Red oxide, pure | lb. | .10 @ | .12 |
| Smith's 444 Crimson f.o.b. Springfield | lb. | .08¾@ | .10 |
| Rub-Er-Red, f.o.b. Easton | lb. | .08¾@ | — |
| Venetian red | lb. | .08 @ | .06 |
| Vermillion, quicksilver, English | lb. | 1.75 @ | 1.80 |
| Whites | | | |
| Lithopone, Akcolith | lb. | .05 3/5@ | .06 |
| Lithopone, Albalith | lb. | .05¼@ | .05¾ |
| Lithopone, Azolith | lb. | .05¼@ | .05¾ |
| Lithopone, Vanolith | lb. | .05¾@ | — |
| Titanium oxide | lb. | .21 @ | — |
| Titanox B, f.o.b. St. Louis, | lb. | .06½@ | .07 |
| Titanox C, f.o.b. St. Louis, | lb. | .07 @ | .07½ |
| **Zinc Oxide—American Process** | | | |
| American Azo: ZZZ (lead free) | lb. | .06½@ | .07 |
| ZZ (leaded) | lb. | .06⅝@ | .06⅞ |
| Horsehead Brand: Special | lb. | .07 @ | .07½ |
| XX Green | lb. | .07 @ | .07½ |
| XX Red, lead free | lb. | .06½@ | .07 |
| Kadox, black label | lb. | .10⅜@ | .10⅞ |
| blue label | lb. | .09⅜@ | .09⅞ |
| red label | lb. | .08 @ | .08½ |
| **Zinc Oxide—French Process** | | | |
| White seal | lb. | .11⅜@ | .11⅞ |
| Green seal | lb. | .10⅜@ | .10⅞ |
| Red seal | lb. | .09⅜@ | .09⅞ |
| Yellows | | | |
| Chrome | lb. | .16½@ | .17 |
| Ocher, French medium | lb. | .02 @ | .03 |
| domestic | lb. | .01⅝@ | .02 |

## COMPOUNDING MATERIALS

| | | | |
|---|---|---|---|
| Aluminum Flake | ton | 21.85 @ | 24.50 |
| Ammonia carbonate, lump | lb. | .07½@ | .07¾ |
| Asbestine | ton | 14.75 @ | 18.00 |
| Barium carbonate | lb. | .03½@ | .05 |
| Barium Dust | lb. | .05 @ | .06 |
| Barytes southern off-color | ton | 12.00 @ | 18.00 |
| Western prime white | ton | 23.00 @ | — |
| imported | ton | 27.00 @ | 36.00 |
| Basofor | lb. | .04½@ | — |
| Bentonite | lb. | .02 @ | .03 |
| Blacks | | | |
| Arrow "Aerfloted" | lb. | .04 @ | .09 |
| Bone Black | lb. | .06 @ | .12½ |
| Carbon, compressed | lb. | .03½@ | .07½ |
| Carbon, uncompressed | lb. | .03½@ | .07½ |
| Disperso, f.o.b. Louisiana | lb. | .03½@ | — |
| Disperso, f.o.b. Texas | lb. | .036 @ | — |
| Drop Black | lb. | .06 @ | .14 |
| Fumonex | lb. | .03½@ | .07½ |
| Excello, compressed | lb. | .05 @ | .09 |
| Gastex, f.o.b. Texas | lb. | .03 @ | .06 |
| Lamp Black | lb. | .10 @ | .40 |
| Micronex | lb. | .04 @ | .09 |
| Thermatomic-Thermax | lb. | | |
| Flex | lb. | | |
| P-33 | lb. | | |
| United carbon, fob Tex. | lb. | .04 @ | .09 |
| Velvetex carbon | lb. | .03 @ | .06 |
| Blanc fixe dry f.o.b. works | ton | 75.00 @ | 90.00 |
| Carrara filler | lb. | .01¾@ | .02 |
| Catalpo (fact.) | lb. | .02 @ | — |
| Clay, Kaolin, domestic | ton | 8.00 @ | 9.00 |
| Aerfloted, Suprex | ton | 8.00 @ | 20.00 |
| Colloidal | lb. | .05 @ | .08 |
| Congaree c. l. f.o.b. mine | ton | 9.00 @ | — |
| Dark Blue Ridge | ton | | |
| Dixie | ton | | |
| Langford | ton | | |
| Lexington | ton | 10.00 @ | 22.00 |
| Mineral Flour, c.l. f.o.b. mine | ton | 20.00 @ | 23.00 |
| Par | ton | | |
| Tensulite | | 15.00 @ | — |
| Glues, extra white | lb. | .22 @ | .26 |
| medium white | lb. | .20 @ | .24 |
| Magnesia, carbonate | lb. | .08¾@ | .11 |
| Mica, white water grnd. | lb. | .06 @ | .08 |
| Off color (biotite) | lb. | .05 @ | .07 |
| Rotten Stone (powdered) | lb. | .02 @ | .05 |
| Soapstone, powdered | ton | 15.00 @ | 22.00 |
| Starch, powdered | cwt. | 3.62 @ | 3.92 |
| Talc, domestic | ton | 12.00 @ | 15.00 |
| Pyrax A | ton | | |
| Whiting, commercial | cwt. | — @ | 1.00 |
| English cliffstone | cwt. | 1.75 @ | 2.00 |
| Quaker | ton | | |
| Superfine | ton | 10.00 @ | 12.00 |
| Sussex | ton | | |
| Witco | ton | 20.00 @ | — |
| Zinc Carbonate | lb. | .09¼@ | .10¼ |
| Zinc Stearate | lb. | .23 @ | .24½ |

## MINERAL RUBBER

| | | | |
|---|---|---|---|
| Genasco (factory) | ton | 50.00 @ | 52.00 |
| Granulated M. R. | ton | | |
| Hard Hydrocarbon | ton | | |
| Paradura | ton | 62.50 @ | 65.00 |
| Parmr, solid | ton | 28.00 @ | 48.00 |
| Pioneer. MR, solid | ton | 40.00 @ | 42.00 |
| Pioneer-granulated | ton | 50.00 @ | 52.00 |
| R & H Hydro-Carbon | ton | 27.05 @ | 29.00 |
| Robertson, MR, solid | ton | 34.00 @ | 80.00 |
| M.R. (gran) | ton | 38.00 @ | 80.00 |

## SOFTENERS

| | | | |
|---|---|---|---|
| Acids | | | |
| Nitric, 36 degrees | cwt. | 5.00 @ | 5.25 |
| Sulfuric, 66 degrees | cwt. | 1.60 @ | 1.95 |
| Tartaric, crystals | lb. | .33½@ | .35 |
| Acids, Fatty | | | |
| Laurex | lb. | .15 @ | .16 |
| Stearex | lb. | .13 @ | .17 |
| Stearic, double pressed | lb. | .17 @ | .22 |
| Alkalies | | | |
| Caustic soda, 76% | cwt. | 3.76 @ | 3.91 |
| Soda ash, 58% C.L. | cwt. | 1.40 @ | |
| Oils | | | |
| Corn, refined, bbls. | lb. | .08¾@ | .10¼ |
| Cottonseed, crude | gal. | .06½@ | .07 |
| Cycline | gal. | .27 @ | .34 |
| Degras (c.l. 100 bbls.) | lb. | .03¾@ | — |
| Less c.l. (10-25 bbls.) | lb. | .04 @ | — |
| Lots less than 10 bbls. | lb. | .04¼@ | .04½ |
| Fluxrite | lb. | .05½@ | .06½ |
| Palm Lagos | lb. | .05¾@ | .06 |
| Niger | lb. | .05⅛@ | .05¼ |
| Para-Flux | gal. | .17 @ | — |
| Petrolatum, white | lb. | .08 @ | .08½ |
| Pigmentaroil | gal. | .18 @ | .23 |
| Pine, steam distilled | gal. | .65 @ | .70 |
| destructively distilled | gal. | .54 @ | .55 |
| Witco Palm Oil | lb. | .11 @ | — |
| Witco Softener (f.o.b. wks.) | lb. | .02 @ | — |
| Resins and Pitches | | | |
| Pitch, Burgundy | lb. | .06½@ | .07½ |
| coal tar | gal. | .05½@ | .06 |
| pine, 200 lb. gr. wt. | bbl. | 7.00 @ | — |
| Rosin, grade K, 280 lb. | bbl. | — @ | 5.45 |
| Pigmentar | gal. | .18 @ | .23 |
| Tar Retort, 50 gal. | bbl. | 13.50 @ | 15.00 |
| Solvents | | | |
| Acetone, pure | lb. | .11 @ | .12 |
| Alcohol, denatured, No. 1 bbls. | gal. | .40 @ | .44 |
| Benzol, 90% | gal. | .21 @ | .23 |
| Carbon, bisulphide | lb. | .05½@ | .06¼ |
| Carbon, tetrachloride | lb. | .06¼@ | .07 |
| Dryolene (f.o.b. Okla.) | gal. | .10 @ | .10½ |
| Gasoline, steel bbls. | gal. | .16 @ | — |
| Naphtha, solvent | gal. | .35 @ | .40 |
| Rub-Sol (f.o.b. Okla.) | gal. | .09 @ | — |
| Turpentine, spirits | gal. | .41 @ | .42 |
| wood | gal. | .37 @ | .39 |
| destructively distilled | gal. | .35 @ | — |
| Waxes | | | |
| Beeswax, white | lb. | .34 @ | .36 |
| Carnauba | lb. | .30 @ | .34 |
| Ceresin, white | lb. | .10 @ | .11 |
| Montan, crude | lb. | .06½@ | .07 |
| Ozokerite, black | lb. | .24 @ | .25 |
| green | lb. | .26 @ | .30 |
| Paraffin (c.l.—f.o.b. N. Y.) | | | |
| Yellow crude scale | lb. | .02½@ | — |
| White crude scale 124/126 | lb. | .02½@ | — |
| Refined, 125/127 | lb. | .03¾@ | — |
| Refined, 128/130 | lb. | .03¾@ | — |
| Refined, 135/137 | lb. | .05¼@ | — |
| Refined, 138/140 | lb. | .07¼@ | — |

## ANTI-OXIDANTS

| | | | |
|---|---|---|---|
| Agerite, Resin | lb. | | |
| Powder | lb. | | |
| White | lb. | | |
| Albasan | lb. | .70 @ | .75 |
| Antox | lb. | | |
| B-L-E | lb. | .57 @ | .60 |
| Neozone | lb. | | |
| Oxynone | lb. | .68 @ | .80 |
| Resistox | lb. | .54 @ | .57 |
| Stabilite | lb. | .57 @ | .62 |
| Stabilite Alba | lb. | .70 @ | .75 |
| VGB | lb. | .55 @ | .66 |

## SPECIALTIES

| | | | |
|---|---|---|---|
| Sunproof | lb. | .35 @ | .37½ |
| Sponge Paste | lb. | — @ | .30 |
| Tonox | lb. | .56 @ | .60 |

## SUBSTITUTES

| | | | |
|---|---|---|---|
| Black | lb. | .08 @ | .14 |
| White | lb. | .10 @ | .16 |
| Brown | lb. | .08 @ | .15 |

## VULCANIZING INGREDIENTS

| | | | |
|---|---|---|---|
| Sulfur Chloride (drums) | lb. | .03½@ | .04½ |
| Sulfur flour, Ref'n'd, 100% pure (bags) | cwt. | 2.40 @ | 2.75 |
| Commercial (bags) | cwt. | 1.75 @ | 2.10 |
| Vandex | lb. | | |

TIRES & TUBES
CRUDE RUBBER

# STATISTICAL SECTION

AUTOMOBILES
GASOLINE

DESPITE the fact that the total of its monthly consumption reports for 1930 amounts to 377,232 long tons, the Rubber Manufacturers Association has made a preliminary estimate of domestic rubber consumption for last year of 372,628 long tons. If the results of its first three quarterly questionnaires were combined with the final three monthly reports, the total would be even less. In view of the greater accuracy of the quarterly figures, therefore, it is likely that the association's estimate for the year as a whole is more nearly correct.

This figure is almost exactly equal to that of 372,528 long tons reported for the year of 1927. It is, of course, far below the record figures of 1928 and 1929 when consumption totaled 442,227 long tons and 466,475 long tons, respectively. From the course of factory production, as indicated by these statistics, it is apparent that the industry permitted an overproduction and overexpansion in 1928 and 1929 which had its effect in piling up record stocks of finished goods. The industry this year is expected to follow more nearly the true course of its natural progress, which lies above the rate of 1927 and 1930, but well below the levels of 1928 and 1929.

**PLAN OF THE SECTION**

**The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.**

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## U. S. Imports and Exports of Crude Rubber

| | Gross Imports | | | Re-exports | | | Net Imports |
|---|---|---|---|---|---|---|---|
| YEARS | Long Tons | Total Declared Value | Average Declared Value per pound Cents | Long Tons | Total Declared Value | Average Declared Value per pound Cents | Long Tons |
| 1921 | 185,394 | 73,772,677 | 17.76 | 5,716 | 2,414,924 | 18.86 | 179,678 |
| 1922 | 301,076 | 101,843,188 | 15.10 | 4,809 | 1,921,828 | 17.84 | 296,267 |
| 1923 | 309,144 | 185,060,304 | 26.72 | 8,772 | 5,672,319 | 28.87 | 300,372 |
| 1924 | 328,056 | 174,231,331 | 23.71 | 10,309 | 6,057,637 | 26.23 | 317,747 |
| 1925 | 396,642 | 429,705,014 | 48.36 | 14,827 | 19,847,753 | 59.76 | 381,815 |
| 1926 | 413,338 | 505,817,807 | 54.63 | 17,671 | 22,470,583 | 56.77 | 395,667 |
| 1927 | 426,258 | 339,874,774 | 35.60 | 27,775 | 24,735,488 | 39.76 | 398,483 |
| 1928 | 439,731 | 244,854,973 | 25.03 | 32,159 | 18,128,361 | 25.17 | 407,572 |
| 1929 | 560,084 | 239,178,783 | 19.15 | 36,485 | 16,868,733 | 20.64 | 523,599 |
| 1928: | | | | | | | |
| Jan. | 39,107 | 30,278,444 | 34.56 | 1,988 | 1,734,990 | 38.95 | 37,119 |
| Feb. | 33,663 | 27,763,655 | 36.82 | 2,738 | 2,229,589 | 36.35 | 30,925 |
| Mar. | 40,611 | 32,103,042 | 35.29 | 3,718 | 2,587,435 | 31.07 | 36,893 |
| Apr. | 37,935 | 27,287,266 | 32.11 | 2,272 | 1,415,024 | 27.80 | 35,663 |
| May | 31,059 | 19,058,672 | 27.39 | 2,399 | 1,386,307 | 25.80 | 28,660 |
| June | 27,765 | 14,121,219 | 22.71 | 2,621 | 1,400,697 | 23.86 | 25,144 |
| July | 31,258 | 14,144,765 | 20.20 | 3,087 | 1,451,446 | 20.99 | 28,171 |
| Aug. | 31,204 | 12,860,150 | 18.39 | 2,377 | 1,084,646 | 20.37 | 28,827 |
| Sept. | 39,835 | 16,512,019 | 18.50 | 3,038 | 1,384,148 | 20.34 | 36,797 |
| Oct. | 44,058 | 18,200,332 | 18.44 | 2,405 | 1,085,407 | 20.15 | 41,653 |
| Nov. | 36,519 | 14,878,441 | 18.19 | 2,788 | 1,207,089 | 18.52 | 33,731 |
| Dec. | 43,511 | 17,580,966 | 18.04 | 2,738 | 1,165,743 | 19.00 | 40,773 |
| 1929: | | | | | | | |
| Jan. | 57,564 | 22,872,943 | 17.74 | 3,663 | 1,773,401 | 21.61 | 53,901 |
| Feb. | 64,265 | 24,760,111 | 17.20 | 2,955 | 1,374,783 | 20.77 | 61,310 |
| Mar. | 50,604 | 20,380,905 | 17.98 | 4,218 | 2,094,037 | 22.16 | 46,386 |
| Apr. | 55,725 | 25,542,726 | 20.46 | 3,293 | 1,624,237 | 22.02 | 52,432 |
| May | 51,161 | 24,355,511 | 21.25 | 2,836 | 1,349,690 | 21.24 | 48,325 |
| June | 41,663 | 18,799,307 | 20.14 | 3,152 | 1,470,746 | 20.83 | 38,511 |
| July | 43,944 | 19,342,147 | 19.65 | 3,424 | 1,590,411 | 20.73 | 40,520 |
| Aug. | 37,222 | 16,530,090 | 19.83 | 2,644 | 1,232,217 | 20.80 | 34,578 |
| Sept. | 34,472 | 15,214,485 | 19.76 | 2,011 | 861,068 | 19.11 | 32,461 |
| Oct. | 38,163 | 16,192,261 | 18.94 | 2,614 | 1,190,510 | 20.33 | 35,549 |
| Nov. | 43,507 | 18,189,305 | 18.66 | 2,929 | 1,300,354 | 19.82 | 40,578 |
| Dec. | 42,952 | 17,573,330 | 18.27 | 2,745 | 1,007,279 | 16.38 | 40,207 |
| 1930: | | | | | | | |
| Jan. | 47,496 | 17,793,563 | 16.72 | 3,144 | 1,077,415 | 15.30 | 44,352 |
| Feb. | 42,687 | 14,798,240 | 15.48 | 2,280 | 960,790 | 18.80 | 40,407 |
| Mar. | 44,976 | 14,653,243 | 14.54 | 3,187 | 1,192,708 | 16.71 | 41,789 |
| Apr. | 45,423 | 14,783,605 | 14.53 | 2,688 | 892,532 | 14.82 | 42,735 |
| May | 42,692 | 13,373,232 | 13.98 | 3,154 | 1,085,432 | 15.37 | 39,538 |
| June | 39,993 | 12,215,848 | 13.79 | 3,125 | 1,027,136 | 14.67 | 36,868 |
| July | 35,183 | 10,553,944 | 13.39 | 2,732 | 736,863 | 12.04 | 32,450 |
| Aug. | 35,713 | 9,666,362 | 12.08 | 2,194 | 646,667 | 13.16 | 33,519 |
| Sept. | 35,380 | 8,460,812 | 10.68 | 1,509 | 429,789 | 12.72 | 33,871 |
| Oct. | 46,069 | 9,893,980 | 9.59 | 2,054 | 848,331 | 7.57 | 44,015 |
| Nov. | 29,401 | 5,700,086 | 8.66 | 1,296 | 271,847 | 9.37 | 28,105 |
| Dec. | | | | | | | |

## U. S. Consumption of Crude Rubber

*(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)*

**Figures on Monthly Basis**

| | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1930 |
|---|---|---|---|---|---|---|---|---|
| Jan. | 30,106 | 29,058 | 29,638 | 32,196 | 31,518 | 34,403 | 43,002 | 36,669 |
| Feb. | 30,149 | 25,736 | 29,761 | 31,136 | 30,137 | 33,702 | 41,594 | 32,726 |
| Mar. | 36,629 | 28,385 | 33,498 | 32,936 | 36,141 | 35,688 | 44,730 | 35,914 |
| Apr. | 29,085 | 27,129 | 34,139 | 32,696 | 35,871 | 32,772 | 47,521 | 40,207 |
| May | 36,155 | 25,845 | 35,322 | 29,364 | 34,592 | 37,333 | 49,233 | 39,902 |
| June | 24,272 | 22,753 | 35,822 | 28,598 | 33,801 | 37,676 | 43,227 | 34,463 |
| July | 17,685 | 23,396 | 36,053 | 27,577 | 29,219 | 37,407 | 41,526 | 29,245 |
| Aug. | 20,359 | 28,982 | 35,909 | 34,533 | 33,460 | 42,927 | 38,274 | 30,575 |
| Sept. | 17,594 | 31,497 | 31,691 | 32,904 | 27,214 | 39,882 | 34,707 | 25,288 |
| Oct. | 21,321 | 31,520 | 29,047 | 29,836 | 26,790 | 40,857 | 34,800 | 27,271 |
| Nov. | 20,437 | 27,289 | 28,853 | 28,080 | 26,792 | 37,461 | 27,659 | 23,479 |
| Dec. | 31,902 | 27,199 | 28,748 | 26,293 | 25,492 | 31,232 | 23,531 | 21,493 |
| Totals | 305,694 | 328,769 | 388,481 | 366,149 | 371,027 | 441,340 | 469,804 | 377,232 |

**Figures on Quarterly Basis**

| Quarter | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1930 |
|---|---|---|---|---|---|---|---|---|
| Jan./Mar. | 96,776 | 87,609 | 95,263 | 94,301 | 99,216 | 103,558 | 128,585 | 101,610 |
| Apr./June | 89,493 | 75,674 | 104,099 | 87,109 | 103,242 | 108,500 | 139,292 | 112,092 |
| July/Sept. | 55,621 | 83,813 | 99,493 | 93,793 | 89,210 | 117,573 | 113,746 | 85,261 |
| Oct./Dec. | 63,617 | 92,656 | 85,789 | 83,212 | 80,860 | 117,597 | 84,872 | |
| Totals | 305,507 | 339,752 | 384,644 | 358,415 | 372,528 | 442,227 | 466,475 | |

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

## U. S. Consumption of Gasoline

*(In Barrels of 42 Gallons)*

| MONTHS | 1929 | 1930 | MONTHS | 1929 | 1930 |
|---|---|---|---|---|---|
| January | 22,602,000 | 25,731,000 | July | 36,860,000 | 38,256,000 |
| February | 22,776,000 | 26,509,000 | August | 37,759,000 | 37,433,000 |
| March | 28,495,000 | 31,029,000 | September | 34,193,000 | 37,823,000 |
| April | 32,019,000 | 34,549,000 | October | 32,816,000 | 32,267,000 |
| May | 34,117,000 | 36,497,000 | November | 31,502,000 | 30,984,000 |
| June | 33,163,000 | 35,902,000 | December | 26,550,000 | |

## Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | Ave |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1928** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| September | — | — | — | 19 | 18¾ | 18⅝ | 18⅝ | 18⅝ | — | 17⅞ | 18¼ | 18⅜ | 18½ | 18¼ | 18½ | 18½ | 18¼ | 18½ | 18½ | 18¼ | 20⅜ | 18⅝ | 18½ | 18⅝ | 18⅝ | 18⅝ | 18⅝ | 18⅝ | 18⅝ | 18⅝ | — | 18⅝ |
| October | 18⅝ | 18½ | 18½ | 18⅝ | 18⅝ | 18⅝ | — | 18⅝ | 18⅝ | 18⅝ | — | — | — | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 18⅝ | 18⅝ |
| November | 18⅝ | 18½ | 18½ | 18½ | — | 18⅝ | 18⅝ | 18⅝ | 18⅝ | 18⅝ | — | 18¼ | 18¼ | 18 | 18 | 18 | 17⅞ | 18 | 18 | 18 | 18 | 18 | 18¼ | 18 | 18 | 18 | 17⅞ | 17⅞ | 17⅞ | 17¾ | 18¼ | 18¼ |
| December | 17¾ | — | 17¾ | 17¾ | 17¾ | 17¾ | 18¼ | 18 | — | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | — | 17⅞ | 17⅞ | 17⅞ | 18¼ | 18¼ | — | 18 |
| **1929** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| January | — | 18½ | 18½ | 18½ | 18½ | 18½ | 18⅝ | 18⅝ | 18⅝ | 18⅝ | 20 | 20 | — | 20 | 19¾ | 20⅜ | 20¼ | 20¼ | 20¼ | 20¼ | 20⅜ | 20⅜ | 21⅜ | 22⅜ | 18⅝ | 18⅝ | 18⅝ | 18⅝ | 21¾ | 21¾ | 22¾ | 20¼ |
| February | 22¾ | 22 | — | 21⅞ | 22¼ | 22¼ | 22¼ | 22¼ | 22¾ | — | — | — | — | 22¾ | 24¾ | 25⅜ | 25⅜ | 25⅜ | 25⅜ | 25½ | 25⅜ | 25½ | 23½ | 26½ | 18½ | 18½ | 18½ | 18½ | 24¼ | 24¼ | — | 24 |
| March | 26 | 26 | — | 26 | 26 | 26 | 25¾ | 25½ | 25½ | — | — | — | — | 24¾ | 24¾ | 24¾ | 24¾ | 24¾ | 24¾ | 24¾ | 24¾ | 24¾ | 23¾ | 23 | — | — | — | — | 24½ | 24½ | — | 24½ |
| April | 23 | 23¼ | 22¼ | 22¾ | 22½ | 22½ | 22¾ | 22½ | 22½ | 22¾ | 22¾ | 22¾ | 21¾ | 21¾ | 21¾ | 21¾ | 21¾ | 21¾ | 21 | 20 | 19¾ | 19¾ | 19¾ | 20¾ | 19¾ | 19¾ | 19¾ | 19¾ | 21¾ | 21½ | 21½ | 21½ |
| May | 19¾ | 19¾ | 19¾ | 21¾ | 20¾ | — | 20¾ | 21½ | 21½ | 21 | 21 | 21 | 21¾ | 21¾ | 21¾ | 22¾ | 22¾ | 23¾ | 23¾ | 23½ | 23¾ | 23¾ | 21¾ | 20¾ | 21¾ | 20¾ | 21¾ | 21¾ | 21¾ | 21¾ | 21½ | 21½ |
| June | 21½ | — | — | — | — | — | — | — | — | 20⅝ | 22 | 21¾ | 20⅝ | 20⅝ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ | 20¾ |
| July | 20¾ | 21¼ | 21 | 21 | 21¼ | 21¼ | — | 21¼ | 22¼ | 22 | 21¾ | 20½ | 21¾ | 21¾ | 21¾ | 21½ | 21½ | 21¾ | 21¾ | 20¾ | 20¾ | 20¾ | 21¾ | 21¾ | 20¾ | 21¾ | 21¾ | 21¾ | 21¾ | 21¾ | 21¾ | 20⅝ |
| Aug. | 21⅝ | 21 | 21 | — | — | 21 | 21 | 21 | 21 | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ |
| Sept. | — | 19½ | — | 20¼ | 20¼ | 20¼ | 20¼ | 20¼ | 20¼ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 20⅝ | 19⅝ | 19½ | 19⅝ | 19⅝ | 19⅝ | 19⅝ | 19⅝ | 19⅝ | 19⅝ | 19⅝ |
| Oct. | 19⅝ | 19½ | — | 19⅝ | 19⅝ | 19⅝ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 20⅜ | 19⅝ | 19½ | 19⅝ | 19⅝ | 19⅝ | 19⅝ | 19⅝ | 19⅝ | 19⅝ | 19⅝ |
| Nov. | 17⅝ | 17½ | — | 17½ | 17⅝ | 17⅝ | 17⅝ | 16⅝ | 16⅝ | 16½ | 16½ | 16½ | 16½ | 16½ | 17 | 17 | 17 | 16½ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16½ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ |
| Dec. | — | 16¼ | — | 16¼ | 16¼ | 16¼ | 16¼ | — | 16⅝ | 16⅝ | 16⅝ | 16⅝ | 16⅝ | 16⅝ | 16⅝ | 16⅝ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ | 16¼ |
| **1930** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| January | — | 16¾ | 16⅝ | 16⅝ | 16⅝ | — | 16⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 14⅞ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ |
| February | 15¾ | — | — | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ |
| March | 15⅝ | — | — | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ | 15⅝ |
| April | 15⅝ | 15½ | 15½ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ | 15¼ |
| May | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ | 14¾ |
| June | 14¾ | 13¾ | 13¾ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ | 13⅜ |
| July | 12¼ | 12¼ | 12 | — | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ | 10½ |
| August | 10¾ | — | — | 10½ | 9 | 8½ | 7¾ | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| September | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ |
| October | 7½ | 8¼ | 8¼ | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| November | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ | 8¾ |
| December | 9½ | 9½ | 9½ | 9¼ | 9¼ | 9¼ | 9¼ | — | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ | 9¾ |
| **1931** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| January | — | 8¾ | 8¾ | — | 8½ | 8⅝ | 8⅝ | 8⅝ | 8⅝ | 8⅝ | 8⅝ | 8⅝ | 8⅝ | 8⅝ | 8⅝ | 8½ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ | 8¼ |

## Average Spot Closing Prices—Ribbed Smoked Sheets

*(New York Market)*

### Average Price per Pound for Years 1910-1921

| Year | Cents | Year | Cents | Year | Cents |
|---|---|---|---|---|---|
| 1910 | 206.60 | 1914 | 65.33 | 1918 | 60.15 |
| 1911 | 141.30 | 1915 | 65.85 | 1919 | 48.70 |
| 1912 | 121.60 | 1916 | 72.50 | 1920 | 36.80 |
| 1913 | 82.04 | 1917 | 72.23 | 1921 | 16.86 |

### Average Monthly Price per Pound Since 1922

| Months | 1922 Cents | 1923 Cents | 1924 Cents | 1925 Cents | 1926 Cents | 1927 Cents | 1928 Cents | 1929 Cents | 1930 Cents |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 18.82 | 32.73 | 25.86 | 36.71 | 79.50 | 38.75 | 40.25 | 20.14 | 15.24 |
| Feb. | 16.12 | 35.14 | 25.29 | 36.01 | 62.25 | 38.25 | 32.75 | 23.97 | 15.85 |
| Mar. | 14.53 | 34.21 | 22.83 | 41.00 | 59.00 | 41.04 | 26.82 | 24.55 | 15.34 |
| Apr. | 15.99 | 32.48 | 22.51 | 43.64 | 51.25 | 40.86 | 18.97 | 21.18 | 14.93 |
| May | 15.25 | 27.39 | 18.89 | 58.47 | 47.75 | 40.76 | 18.99 | 21.46 | 14.24 |
| June | 15.11 | 26.88 | 18.81 | 77.26 | 42.50 | 37.25 | 19.59 | 20.64 | 12.45 |
| July | 14.67 | 26.10 | 22.16 | 103.16 | 41.03 | 34.87 | 19.40 | 21.30 | 11.24 |
| Aug. | 13.93 | 28.84 | 26.17 | 82.99 | 38.50 | 35.12 | 19.46 | 20.59 | 9.96 |
| Sept. | 14.44 | 28.95 | 27.56 | 88.88 | 41.00 | 33.67 | 18.47 | 20.37 | 8.28 |
| Oct. | 19.78 | 26.93 | 31.13 | 98.01 | 42.50 | 34.32 | 18.83 | 19.67 | 8.20 |
| Nov. | 23.88 | 27.14 | 34.33 | 104.80 | 38.50 | 37.58 | 18.26 | 16.62 | 9.01 |
| Dec. | 27.42 | 26.60 | 37.88 | 98.51 | 38.25 | 40.63 | 17.97 | 16.12 | 9.05 |
| Average for Year | 17.50 | 29.45 | 26.20 | 72.46 | 48.50 | 37.72 | 22.48 | 20.55 | 11.98 |

## London Closing Prices of Ribbed Smoked Sheet

*(In Pence Per Pound)*

| Day | Oct. | Nov. | Dec. | Jan. | Day | Oct. | Nov. | Dec. | Jan. |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 3⅝ | 4⅜ | 4⅝ | — | 17 | 3⅞ | 4⅝ | 4¼ | 4¼ |
| 2 | 3¾ | — | 4¾ | — | 18 | 3⅞ | 4⅝ | 4½ | — |
| 3 | 4 | 4¼ | 4¾ | 4⅛ | 19 | — | 4⅝ | 4⅜ | 4¼ |
| 4 | 4 | 4¼ | 4⅝ | — | 20 | 4 | 4⅝ | 4⅜ | 4¼ |
| 5 | — | 4½ | 4⅝ | 4¼ | 21 | 4⅛ | 4⅝ | — | — |
| 6 | 3⅞ | 4⅜ | 4⅜ | 4½ | 22 | 4 | 4⅜ | 4⅜ | — |
| 7 | 3⅞ | 4¼ | — | 4¼ | 23 | 4⅛ | — | 4¼ | — |
| 8 | 4 | 4⅛ | 4¾ | 4⅛ | 24 | 4¼ | 4⅝ | 4⅜ | — |
| 9 | 4 | — | 4¾ | 4¼ | 25 | 4⅜ | 4⅝ | — | — |
| 10 | 3⅞ | 4¼ | 4¾ | 4¼ | 26 | — | 4⅝ | — | — |
| 11 | 3⅞ | 4¾ | 4¾ | — | 27 | 4¼ | 4½ | — | — |
| 12 | — | 4⅜ | 4⅝ | 4¼ | 28 | 4¼ | 4½ | — | — |
| 13 | 3⅞ | 4⅜ | 4⅜ | — | 29 | 4⅜ | 4⅝ | 4¼ | — |
| 14 | 3⅞ | 4½ | — | 4¼ | 30 | 4⅜ | — | 4⅛ | — |
| 15 | 3⅞ | 4½ | 4½ | 4¼ | 31 | 4⅜ | — | 4¼ | — |
| 16 | 3⅞ | — | 4⅜ | 4¼ | | | | | |

### Average Monthly Price Per Pound

| Month | 1928 Pence | 1929 Pence | 1930 Pence | Month | 1928 Pence | 1929 Pence | 1930 Pence |
|---|---|---|---|---|---|---|---|
| Jan. | 19.310 | 9.942 | 7.471 | Aug. | 9.300 | 10.505 | 4.880 |
| Feb. | 15.713 | 11.875 | 7.948 | Sept. | 8.530 | 10.160 | 4.075 |
| Mar. | 12.736 | 12.135 | 7.595 | Oct. | 8.807 | 9.620 | 4.023 |
| Apr. | 8.864 | 10.490 | 7.391 | Nov. | 8.596 | 8.442 | 4.440 |
| May | 8.845 | 10.717 | 6.926 | Dec. | 8.570 | 7.958 | 4.516 |
| June | 9.293 | 10.580 | 6.195 | Average | | | |
| July | 9.312 | 11.065 | 5.648 | for Year | 10.656 | 10.291 | 5.926 |

## Spot Closing Cotton Prices

*(Middling Upland Grade—New York Market)*

### Recent Daily Price Per Pound

| Day of Month | Dec. | Jan. | Day of Month | Dec. | Jan. | Day of Month | Dec. | Jan. |
|---|---|---|---|---|---|---|---|---|
| 1 | 10.40 | —— | 11 | 9.85 | —— | 21 | —— | —— |
| 2 | 10.60 | 10.15 | 12 | 9.85 | 10.00 | 22 | 9.80 | —— |
| 3 | 10.60 | 10.30 | 13 | 9.60 | 10.05 | 23 | 9.80 | —— |
| 4 | 10.45 | —— | 14 | —— | 10.05 | 24 | 9.85 | —— |
| 5 | 10.45 | 10.15 | 15 | 9.45 | 10.10 | 25 | —— | —— |
| 6 | 10.45 | 10.15 | 16 | 9.60 | 10.15 | 26 | 9.80 | —— |
| 7 | —— | 10.25 | 17 | 9.95 | 10.15 | 27 | 9.80 | —— |
| 8 | 10.30 | 10.30 | 18 | 9.80 | —— | 28 | —— | —— |
| 9 | 10.30 | 10.20 | 19 | 9.75 | 10.15 | 29 | 9.95 | —— |
| 10 | 10.15 | 10.45 | 20 | 9.85 | 10.20 | 30 | 10.00 | —— |
| | | | | | | 31 | 10.00 | —— |

### Average Monthly Price Per Pound

| Month | 1928 Cents | 1929 Cents | 1930 Cents | Month | 1928 Cents | 1929 Cents | 1930 Cents |
|---|---|---|---|---|---|---|---|
| Jan. | 19.12 | 20.22 | 17.21 | Aug. | 19.28 | 18.62 | 12.03 |
| Feb. | 18.40 | 20.21 | 15.62 | Sept. | 18.67 | 18.83 | 10.85 |
| Mar. | 19.38 | 20.19 | 15.13 | Oct. | 19.62 | 18.46 | 10.61 |
| Apr. | 20.63 | 20.29 | 16.39 | Nov. | 19.84 | 17.53 | 10.96 |
| May | 21.58 | 19.41 | 16.43 | Dec. | 20.22 | 17.28 | 10.02 |
| June | 21.50 | 18.74 | 14.48 | Average | | | |
| July | 21.36 | 18.62 | 13.10 | for Year | 19.97 | 19.03 | 13.57 |

# World Stocks of Crude Rubber

## ON HAND OR AFLOAT TO THE U. S.

| At End of | ON HAND | | | AFLOAT | | | ON HAND AND AFLOAT | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1928 | 1929 | 1930 | 1928 | 1929 | 1930 | 1928 | 1929 | 1930 |
| Jan. | 110,244 | 76,342 | 126,068 | 46,441 | 93,330 | 65,483 | 156,685 | 169,672 | 191,551 |
| Feb. | 108,955 | 90,058 | 134,790 | 48,044 | 75,790 | 71,015 | 156,999 | 165,848 | 205,805 |
| Mar. | 114,061 | 100,536 | 141,843 | 43,378 | 67,065 | 63,646 | 157,439 | 167,601 | 205,489 |
| Apr. | 113,083 | 107,659 | 148,272 | 32,783 | 65,798 | 63,261 | 145,866 | 173,457 | 211,533 |
| May | 105,356 | 97,192 | 146,179 | 33,145 | 65,793 | 68,168 | 138,501 | 162,985 | 214,347 |
| June | 90,198 | 92,061 | 151,485 | 38,302 | 54,668 | 58,657 | 128,590 | 146,729 | 210,142 |
| July | 83,242 | 92,535 | 152,001 | 42,943 | 46,145 | 58,326 | 126,185 | 138,680 | 210,327 |
| Aug. | 68,994 | 90,769 | 158,178 | 54,904 | 49,423 | 61,168 | 123,898 | 140,192 | 219,346 |
| Sept. | 68,851 | 84,362 | 169,607 | 52,692 | 58,758 | 60,923 | 121,543 | 143,120 | 230,530 |
| Oct. | 66,421 | 88,483 | 184,701 | 45,646 | 59,180 | 51,122 | 112,067 | 147,663 | 235,823 |
| Nov. | 61,956 | 92,219 | 189,925 | 75,502 | 62,358 | 52,538 | 137,458 | 154,577 | 242,463 |
| Dec. | 66,166 | 118,609 | 203,221 | 92,037 | 62,388 | 56,035 | 158,203 | 180,997 | 259,256 |

(Rubber Manufacturers' Association figures raised to 100%.)

## STOCKS IN GREAT BRITAIN

### Stocks in London

*(No. of Tons in Wharves and Warehouses, including Latex)*

| At end of | 1928 | 1929 | 1930 | At end of | 1928 | 1929 | 1930 |
|---|---|---|---|---|---|---|---|
| Jan. | 66,524 | 25,191 | 60,434 | July | 35,429 | 30,080 | 81,048 |
| Feb. | 62,964 | 25,554 | 64,557 | Aug. | 32,084 | 35,605 | 80,931 |
| Mar. | 58,272 | 28,214 | 68,928 | Sept. | 31,440 | 42,188 | 83,329 |
| Apr. | 53,425 | 31,368 | 74,676 | Oct. | 24,207 | 47,803 | 77,647 |
| May | 44,628 | 31,290 | 77,312 | Nov. | 17,775 | 52,454 | 76,887 |
| June | 38,756 | 31,025 | 80,260 | Dec. | 19,815 | 54,304 | |

### At End of Recent Weeks

| | First Saturday | Second Saturday | Third Saturday | Fourth Saturday | Fifth Saturday |
|---|---|---|---|---|---|
| 1930 | | | | | |
| September | 81,830 | 82,233 | 82,648 | 83,136 | |
| October | 81,544 | 82,245 | 83,102 | 82,218 | |
| November | 77,480 | 75,159 | 76,042 | 76,448 | 76,670 |
| December | 76,877 | 77,493 | 77,460 | 77,328 | |
| 1931 | | | | | |
| January | 78,042 | 78,761 | 79,261 | | |

### Stocks in Liverpool

| | | | | |
|---|---|---|---|---|
| 1930 | | | | |
| September | 31,159 | 31,796 | 34,085 | 34,853 |
| October | 36,378 | 37,244 | 37,211 | 38,345 |
| November | 38,941 | 39,336 | 40,003 | 40,492 | 39,933 |
| December | 40,349 | 40,281 | 40,300 | 40,593 | |
| 1931 | | | | | |
| January | 41,516 | 41,814 | 42,270 | | |

## STOCKS IN PENANG AND SINGAPORE

*(Stocks held by Dealers—Quantities in Long Tons)*

| End of | 1928 | 1929 | 1930 | End of | 1928 | 1929 | 1930 |
|---|---|---|---|---|---|---|---|
| Jan. | 25,868 | 29,617 | 39,727 | July | 18,663 | 33,859 | 45,459 |
| Feb. | 22,867 | 32,373 | 44,371 | Aug. | 18,971 | 30,854 | 48,132 |
| Mar. | 20,538 | 29,437 | 45,657 | Sept. | 14,898 | 32,138 | 44,015 |
| Apr. | 16,946 | 26,474 | 48,478 | Oct. | 12,149 | 33,770 | 39,930 |
| May | 17,437 | 30,764 | 44,715 | Nov. | 29,188 | 30,963 | — |
| June | 18,207 | 30,403 | 42,451 | Dec. | 32,895 | 35,548 | — |

## STOCKS IN OTHER CENTRES

| 1930 End of | Malaya Mainland | Afloat for Europe | Holland | Colombo | Para and Manaos |
|---|---|---|---|---|---|
| Jan. | 44,740 | 28,440 | 2,154 | 5,400 | 3,668 |
| Feb. | 41,955 | 28,180 | 2,159 | 5,000 | 4,370 |
| Mar. | 39,206 | 27,510 | 2,220 | 4,759 | 4,578 |
| Apr. | 39,758 | 28,580 | 2,204 | 4,000 | 4,482 |
| May | 26,482 | 22,730 | 2,308 | 4,000 | 4,388 |
| June | 36,578 | 20,920 | 2,316 | 3,856 | 4,588 |
| July | 38,311 | 27,290 | 2,312 | 4,500 | 4,665 |
| Aug. | 39,482 | 30,310 | 2,196 | 5,200 | 4,489 |
| Sept. | 39,863 | 31,000 | 2,343 | 5,834 | 4,854 |
| Oct. | 38,587 | 30,000 | 2,378 | | 5,156 |
| Nov. | 40,551 | | | | 4,535 |

# Rims Inspected and Passed in U. S.

*(Tire and Rim Association Reports)*

| | Total | Per Cent Balloons | | Total | Per Cent Balloons |
|---|---|---|---|---|---|
| 1923 | 23,140,620 | 0.6 | 1927 | 19,700,003 | 79.1 |
| 1924 | 21,863,311 | 19.7 | 1928 | 24,247,282 | 81.6 |
| 1925 | 26,001,664 | 66.8 | 1929 | 24,141,502 | 80.3 |
| 1926 | 24,199,524 | 78.8 | 1930 | 17,364,096 | 80.1 |
| 1930 | | | 1930 | | |
| January | 1,601,326 | 84.0 | July | 1,449,161 | 80.7 |
| February | 1,653,421 | 78.9 | August | 1,504,187 | 78.1 |
| March | 2,061,999 | 79.1 | September | 1,052,109 | 80.2 |
| April | 2,339,834 | 81.1 | October | 863,579 | 73.3 |
| May | 2,010,067 | 84.3 | November | 920,485 | 72.2 |
| June | 1,338,226 | 83.5 | December | 567,355 | 69.1 |

# U. S. Tire and Tube Statistics

*(All Figures Represent Thousands)*

## AUTOMOBILE CASINGS

### Figures for Recent Years

| | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|---|---|---|---|---|---|---|---|---|
| Production | 40,932 | 45,259 | 51,633 | 60,845 | 61,237 | 64,439 | 77,944 | 68,726 |
| Shipments | 39,987 | 45,204 | 50,120 | 59,262 | 59,002 | 64,059 | 74,296 | 69,395 |
| Inventory[2] | 6,132 | 5,772 | 7,427 | 8,142 | 10,456 | 10,264 | 13,624 | 11,838 |

### Figures for Recent Months

| | PRODUCTION | | | SHIPMENTS | | | INVENTORY | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1928 | 1929 | 1930 | 1928 | 1929 | 1930 | 1928 | 1929 | 1930 |
| Jan. | 5,358 | 6,301 | 4,485 | 5,304 | 6,211 | 4,406 | 9,949 | 12,855 | 11,924 |
| Feb. | 6,363 | 6,479 | 4,555 | 5,031 | 4,951 | 4,195 | 11,721 | 14,525 | 11,410 |
| Mar. | 6,819 | 7,049 | 4,863 | 5,731 | 6,289 | 4,717 | 12,389 | 15,329 | 12,513 |
| Apr. | 6,178 | 7,391 | 5,648 | 5,812 | 6,838 | 5,089 | 12,717 | 15,870 | 13,076 |
| May | 6,759 | 7,686 | 3,717 | 6,457 | 6,735 | 5,216 | 13,024 | 16,733 | 13,432 |
| June | 6,692 | 6,847 | 5,122 | 7,117 | 6,800 | 5,294 | 12,162 | 16,497 | 13,277 |
| July | 6,498 | 6,820 | 3,991 | 7,895 | 7,364 | 5,447 | 11,157 | 15,034 | 11,812 |
| Aug. | 7,469 | 5,693 | 4,166 | 8,403 | 7,354 | 5,175 | 10,034 | 13,337 | 10,848 |
| Sept. | 6,802 | 4,460 | 3,365 | 7,145 | 5,623 | 4,405 | 9,705 | 12,070 | 9,812 |
| Oct. | 7,326 | 4,611 | 3,582 | 5,717 | 4,649 | 3,499 | 11,520 | 12,042 | 9,803 |
| Nov. | 6,075 | 3,378 | 2,654 | 4,998 | 3,355 | 2,834 | 12,579 | 12,127 | 9,595 |
| Dec. | 5,605 | 3,057 | | 4,591 | 3,237 | | 13,624 | 11,838 | |

## AUTOMOBILE INNER TUBES

### Figures for Recent Years

| | 1922 | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 |
|---|---|---|---|---|---|---|---|---|
| Production | 50,850 | 60,116 | 70,706 | 82,614 | 76,618 | 70,823 | 80,180 | 68,829 |
| Shipments | 49,673 | 59,072 | 68,016 | 81,004 | 71,591 | 72,896 | 77,127 | 70,592 |
| Inventory[2] | 7,643 | 8,425 | 11,052 | 11,313 | 16,200 | 13,692 | 16,117 | 12,807 |

### Figures for Recent Months

| | PRODUCTION | | | SHIPMENTS | | | INVENTORY | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1928 | 1929 | 1930 | 1928 | 1929 | 1930 | 1928 | 1929 | 1930 |
| Jan. | 5,441 | 6,109 | 4,607 | 6,072 | 6,789 | 4,857 | 12,982 | 14,424 | 12,704 |
| Feb. | 6,895 | 6,346 | 4,634 | 5,431 | 4,948 | 4,337 | 14,650 | 15,936 | 13,036 |
| Mar. | 6,231 | 7,000 | 4,941 | 5,731 | 6,317 | 4,727 | 15,573 | 16,641 | 13,179 |
| Apr. | 6,661 | 7,157 | 5,510 | 5,702 | 6,716 | 4,848 | 16,632 | 17,000 | 13,784 |
| May | 7,168 | 7,181 | 5,585 | 6,300 | 6,598 | 5,074 | 17,702 | 17,745 | 13,852 |
| June | 6,953 | 6,542 | 4,950 | 7,136 | 6,515 | 5,265 | 17,159 | 17,294 | 13,612 |
| July | 6,674 | 5,793 | 3,939 | 8,729 | 7,605 | 5,855 | 14,974 | 15,311 | 11,657 |
| Aug. | 8,343 | 5,481 | 4,796 | 9,850 | 7,672 | 5,762 | 13,981 | 13,072 | 10,737 |
| Sept. | 7,103 | 5,190 | 3,817 | 7,154 | 5,859 | 4,541 | 13,543 | 12,585 | 10,065 |
| Oct. | 6,929 | 5,000 | 3,951 | 5,662 | 4,689 | 3,472 | 15,285 | 12,802 | 10,517 |
| Nov. | 5,592 | 3,544 | 2,680 | 5,002 | 3,480 | 2,788 | 15,743 | 12,845 | 10,313 |
| Dec. | 5,184 | 3,484 | | 4,858 | 3,404 | | 16,117 | 12,807 | |

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete beginning with 1929, and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

# Automobile Production

| | United States | | | Canada | | | Grand Total |
|---|---|---|---|---|---|---|---|
| | Total | Passenger Cars | Trucks | Total | Passenger Cars | Trucks | |
| 1923 | 4,020,255 | 3,631,728 | 388,527 | 146,438 | 129,228 | 17,210 | 4,166,693 |
| 1924 | 3,600,918 | 3,203,049 | 397,869 | 185,246 | 167,765 | 17,481 | 3,786,164 |
| 1925 | 4,265,704 | 3,760,459 | 505,245 | 161,389 | 139,311 | 22,078 | 4,427,093 |
| 1926 | 4,298,799 | 3,808,753 | 490,046 | 205,002 | 164,493 | 40,509 | 4,503,891 |
| 1927 | 3,393,987 | 2,988,868 | 453,019 | 179,426 | 146,850 | 32,556 | 3,573,313 |
| 1928 | 4,357,384 | 3,826,613 | 530,771 | 242,382 | 196,737 | 45,645 | 4,599,944 |
| 1929 | | | | | | | |
| Jan. | 402,154 | 350,617 | 51,537 | 21,501 | 17,164 | 4,337 | 423,655 |
| Feb. | 466,084 | 407,589 | 58,495 | 31,287 | 25,584 | 5,703 | 497,371 |
| March | 584,733 | 513,266 | 69,559 | 40,621 | 32,833 | 7,788 | 625,354 |
| April | 620,656 | 538,679 | 81,977 | 41,901 | 34,392 | 7,509 | 662,557 |
| May | 603,969 | 516,055 | 86,596 | 31,559 | 25,129 | 6,430 | 635,528 |
| June | 545,252 | 453,956 | 91,296 | 21,492 | 16,511 | 4,981 | 566,744 |
| July | 500,331 | 427,213 | 73,118 | 17,461 | 13,600 | 3,861 | 517,792 |
| Aug. | 499,699 | 444,711 | 54,918 | 14,214 | 11,037 | 3,177 | 513,843 |
| Sept. | 415,332 | 365,651 | 49,681 | 13,817 | 10,710 | 3,107 | 429,149 |
| Oct. | 380,011 | 321,195 | 58,816 | 14,523 | 8,975 | 5,548 | 394,534 |
| Nov. | 217,570 | 170,928 | 46,642 | 9,424 | 7,137 | 2,287 | 226,994 |
| Dec. | 119,950 | 92,717 | 27,233 | 5,495 | 4,426 | 1,069 | 125,445 |
| TOTAL | 5,358,420 | 4,587,400 | 771,020 | 263,295 | 207,498 | 55,797 | 5,621,715 |
| 1930 | | | | | | | |
| Jan. | 273,089 | 235,099 | 37,990 | 10,388 | 8,856 | 1,532 | 283,477 |
| Feb. | 346,940 | 297,483 | 49,457 | 15,548 | 13,021 | 2,527 | 362,488 |
| March | 401,378 | 336,178 | 64,200 | 20,730 | 17,165 | 3,565 | 422,108 |
| April | 442,630 | 375,171 | 67,459 | 24,257 | 20,872 | 3,385 | 466,887 |
| May | 417,154 | 362,784 | 54,370 | 24,672 | 21,251 | 3,421 | 441,826 |
| June | 335,475 | 289,704 | 45,771 | 15,090 | 12,194 | 2,896 | 350,565 |
| July | 262,343 | 222,700 | 39,643 | 10,188 | 8,556 | 1,632 | 272,531 |
| Aug. | 223,046 | 187,288 | 35,758 | 9,792 | 6,946 | 2,846 | 232,838 |
| Sept. | 216,877 | 175,720 | 41,157 | 7,957 | 5,623 | 2,334 | 224,834 |
| Oct. | 150,044 | 112,800 | 37,244 | 4,541 | 3,206 | 1,335 | 154,585 |
| Nov. | 129,437 | 98,137 | 31,300 | 5,407 | 3,527 | 1,880 | 134,844 |
| Dec. | | | | | | | |

# Exports of Crude Rubber from Principal Producing Countries

*(Long Tons)*

| | BRITISH MALAYA[1] | | | | | | | DUTCH EAST INDIES[5] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gross Exports | Imports | Gross Exports Minus Imports | Ceylon[2] | India & Burma[3] | Sarawak[4] | British North Borneo[3] | Siam[4] | Java & Madura | Sumatra E. Coast | Other D.E.I. | Indo-China[3] | Amazon Valley | All Other[6] | World Total[7] |
| 1923 | 252,016 | 70,432 | 181,584 | 39,971 | 6,416 | 5,705 | 4,237 | 1,718 | 32,930 | 46,344 | 57,822 | 5,067 | 16,765 | 7,856 | 406,955 |
| 1924 | 259,706 | 108,524 | 151,182 | 39,997 | 7,697 | 6,699 | 4,621 | 2,962 | 42,446 | 54,497 | 80,347 | 6,688 | 23,165 | 9,065 | 429,366 |
| 1925 | 316,825 | 158,022 | 158,803 | 49,566 | 10,082 | 5,424 | 5,377 | 5,377 | 46,757 | 65,499 | 120,626 | 7,881 | 25,298 | 13,797 | 517,528 |
| 1926 | 391,328 | 151,243 | 240,085 | 58,962 | 9,874 | 9,155 | 6,079 | 4,027 | 52,186 | 71,413 | 121,231 | 8,203 | 24,298 | 16,017 | 621,530 |
| 1927 | 371,322 | 182,845 | 188,477 | 55,356 | 11,321 | 10,923 | 6,582 | 5,472 | 55,297 | 77,815 | 142,171 | 8,645 | 28,782 | 15,633 | 606,474 |
| 1928 | 409,430 | 149,787 | 259,643 | 57,267 | 10,790 | 10,087 | 6,698 | 4,813 | 58,848 | 82,511 | 121,770 | 9,548 | 21,129 | 10,690 | 653,794 |
| 1929 | 574,836 | 163,092 | 411,744 | 81,584 | 11,663 | 11,077 | 7,381 | 5,018 | 65,990 | 87,789 | 134,037 | 9,696 | 21,148 | 6,767 | 853,894 |
| 1928: | | | | | | | | | | | | | | | |
| Sept. | 29,769 | 11,239 | 18,530 | 4,675 | 457 | 938 | 594 | 447 | 4,956 | 6,536 | 9,863 | 969 | 1,614 | 494 | 50,073 |
| Oct. | 24,476 | 12,603 | 11,873 | 3,999 | 864 | 949 | 564 | 457 | 5,295 | 7,474 | 10,124 | 513 | 1,399 | 732 | 44,243 |
| Nov. | 68,135 | 10,436 | 57,699 | 8,005 | 1,048 | 772 | 564 | 425 | 4,950 | 7,902 | 7,805 | 943 | 1,790 | 623 | 92,526 |
| Dec. | 66,763 | 11,122 | 55,641 | 7,848 | 1,113 | 744 | 565 | 294 | 5,120 | 8,792 | 10,896 | 948 | 2,220 | 588 | 94,769 |
| 1929: | | | | | | | | | | | | | | | |
| Jan. | 52,546 | 13,415 | 39,131 | 8,301 | 1,664 | 873 | 600 | 461 | 5,640 | 8,067 | 11,076 | 850 | 2,134 | 642 | 79,439 |
| Feb. | 47,926 | 12,103 | 35,823 | 7,064 | 1,117 | 955 | 600 | 495 | 6,572 | 7,511 | 10,384 | 807 | 2,104 | 520 | 73,952 |
| Mar. | 49,448 | 14,553 | 34,895 | 6,583 | 1,413 | 758 | 601 | 499 | 5,515 | 6,620 | 10,629 | 658 | 2,332 | 786 | 71,289 |
| Apr. | 49,816 | 11,414 | 38,402 | 5,097 | 727 | 747 | 548 | 306 | 5,997 | 6,645 | 11,321 | 673 | 1,950 | 569 | 72,982 |
| May | 43,960 | 15,593 | 28,367 | 5,723 | 800 | 966 | 548 | 453 | 6,264 | 6,961 | 13,437 | 1,059 | 1,922 | 733 | 67,233 |
| June | 40,398 | 14,344 | 26,054 | 5,563 | 1,122 | 1,061 | 547 | 422 | 5,582 | 6,693 | 11,270 | 757 | 1,398 | 548 | 61,017 |
| July | 46,454 | 15,071 | 31,383 | 5,457 | 974 | 1,247 | 641 | 462 | 6,422 | 7,192 | 13,995 | 575 | 1,457 | 543 | 70,848 |
| Aug. | 50,441 | 15,469 | 34,972 | 6,079 | 685 | 993 | 641 | 431 | 4,644 | 7,298 | 10,782 | 1,032 | 1,563 | 499 | 69,619 |
| Sept. | 53,484 | 12,392 | 41,092 | 7,993 | 884 | 832 | 640 | 406 | 4,708 | 7,517 | 10,149 | 655 | 1,566 | 504 | 76,446 |
| Oct. | 47,937 | 12,516 | 35,421 | 8,381 | 812 | 1,047 | 671 | 485 | 4,697 | 8,295 | 10,512 | 893 | 1,606 | 445 | 73,265 |
| Nov. | 46,279 | 11,204 | 35,075 | 6,660 | 1,065 | 668 | 672 | 278 | 4,760 | 6,711 | 9,380 | 771 | 1,442 | 535 | 68,017 |
| Dec. | 46,147 | 15,018 | 31,129 | 8,683 | 900 | 930 | 672 | 320 | 5,189 | 8,279 | 11,102 | 966 | 1,674 | 443 | 70,287 |
| 1930: | | | | | | | | | | | | | | | |
| Jan. | 52,535 | 11,773 | 40,762 | 7,741 | 1,560 | 791 | 642 | 386 | 5,709 | 7,831 | 8,920 | 856 | 1,837 | 585 | 77,620 |
| Feb. | 48,947 | 12,960 | 35,987 | 7,825 | 1,245 | 847 | 642 | 469 | 6,900 | 7,191 | 11,414 | 944 | 1,797 | 480 | 75,741 |
| Mar. | 47,320 | 13,236 | 34,084 | 6,269 | 1,129 | 976 | 642 | 391 | 5,796 | 6,612 | 11,070 | 643 | 1,674 | 536 | 69,822 |
| Apr. | 45,517 | 16,331 | 29,186 | 5,030 | 856 | 1,026 | 502 | 366 | 4,802 | 6,326 | 12,582 | 433 | 1,201 | 630 | 62,940 |
| May | 49,388 | 36,135 | 13,253 | 5,947 | 975 | 917 | 502 | 350 | 6,352 | 6,661 | 11,916 | 753 | 1,383 | 555 | 49,564 |
| June | 36,657 | 12,120 | 24,537 | 4,152 | 778 | 1,040 | 201 | 392 | 4,728 | 4,776 | 9,512 | 425 | 974 | 551 | 52,066 |
| July | 41,347 | 12,759 | 28,588 | 4,619 | 792 | 1,087 | 600 | 327 | 6,022 | 5,891 | 9,770 | 648 | 810 | 418 | 59,572 |
| Aug. | 47,982 | 10,304 | 37,678 | 6,779 | 600 | 740 | 500* | 335 | 5,982 | 7,197 | 9,520 | 394 | 809 | 382 | 70,916* |
| Sept. | 48,529 | 8,087 | 40,442 | 7,920 | 343 | 680 | 400* | 289 | 5,960 | 6,358 | 7,302 | 527 | 1,093 | 400* | 71,714* |
| Oct. | 47,770 | 7,312 | 40,458 | 7,388 | 591 | 598 | 400* | 247 | 5,916 | 6,956 | 6,352 | 667 | 669 | 400* | 70,642* |
| Nov. | 41,420 | 7,566 | 33,854 | 5,835 | | | | | | | | 654 | 658 | | |

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927 and 1,437 in 1928. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, and 1,459 tons in 1928. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

# Net Imports of Crude Rubber into Principal Manufacturing Countries

*(Long Tons)*

| | United States[1] | United Kingdom | France (h) | Germany | Canada (ac) | Japan (da) | Italy | Russia (ee) | Australia (cd) | Belgium (d) | Netherlands | Scandinavia (abcdf) | Spain (g) | Czechoslovakia (abcd) | World Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1919 | 238,407 | 42,671 | 17,685 | 5,584 | 6,395 | 9,753 | 9,894 | 75 | 1,002 | 3,995 | 2,771 | 3,149 | 2,418 | 9 | 343,808 |
| 1920 | 249,530 | 56,844 | 13,885 | 11,890 | 11,746 | 5,297 | 6,123 | 62 | 1,815 | 3,840 | 5,510 | 2,292 | 2,008 | 567 | 371,399 |
| 1921 | 179,736 | 42,087 | 15,135 | 21,920 | 8,124 | 21,713 | 3,906 | 165 | 1,014 | 1,705 | 1,022 | 1,279 | 2,245 | 569 | 300,620 |
| 1922 | 296,594 | 11,724 | 24,352 | 27,546 | 9,207 | 15,934 | 6,430 | 2,493 | 2,643 | 172 | —3,807 | 1,778 | 589 | 567 | 396,012 |
| 1923 | 301,527 | 12,700 | 27,392 | 18,519 | 18,277 | 15,372 | 8,489 | 2,986 | 1,649 | 2,184 | 792 | 2,528 | 630 | 1,128 | 409,173 |
| 1924 | 319,103 | —11,550 | 30,446 | 22,727 | 14,299 | 19,571 | 8,764 | 2,346 | 3,124 | 2,688 | —807 | 3,178 | 944 | 1,370 | 416,203 |
| 1925 | 385,596 | 4,061 | 32,956 | 33,937 | 19,683 | 11,117 | 11,412 | 7,088 | 4,757 | 2,930 | 875 | 3,149 | 1,155 | 1,558 | 520,274 |
| 1926 | 399,981 | 84,865 | 34,240 | 22,775 | 20,229 | 18,125 | 9,809 | 6,529 | 9,021 | 2,498 | 2,670 | 4,046 | 1,299 | 1,870 | 617,957 |
| 1927 | 403,472 | 60,249 | 34,271 | 38,892 | 26,405 | 20,521 | 11,381 | 12,018 | 9,490 | 6,482 | 636 | 4,224 | 2,055 | 2,672 | 632,808 |
| 1928 | 407,572 | 4,846 | 36,498 | 37,855 | 30,447 | 25,621 | 12,433 | 15,134 | 8,430 | 7,958 | 2,243 | 4,418 | 3,178 | 3,138 | 599,771 |
| 1929 | 528,608 | 122,675 | 55,093 | 49,275 | 35,453 | 34,284 | 17,169 | 11,774 | 15,886 | 9,445 | 3,022 | 6,440 | 864 | 4,650 | 894,015 |
| 1928: | | | | | | | | | | | | | | | |
| Sept. | 36,800 | 4,199 | 3,524 | 3,553 | 2,812 | 1,837 | 1,278 | 20 | 603 | 597 | 245 | 377 | 277 | 235 | 56,457 |
| Oct. | 41,667 | —934 | 3,728 | 4,386 | 2,943 | 3,711 | 1,049 | 98 | 766 | 696 | 141 | 527 | 250 | 318 | 59,346 |
| Nov. | 33,846 | —3,141 | 3,278 | 3,694 | 2,799 | 2,150 | 1,340 | 689 | 837 | 544 | 31 | 337 | 252 | 282 | 46,938 |
| Dec. | 40,781 | 8,438 | 3,633 | 2,470 | 2,618 | 3,002 | 1,145 | 1,378 | 755 | 639 | 148 | 435 | 263 | 206 | 65,905 |
| 1929: | | | | | | | | | | | | | | | |
| Jan. | 53,922 | 11,951 | 5,645 | 4,711 | 3,759 | 3,776 | 1,481 | 956 | 1,061 | 749 | 218 | 638 | 179 | 525 | 89,571 |
| Feb. | 61,331 | 5,179 | 5,001 | 4,613 | 2,908 | 2,727 | 1,259 | 684 | 1,131 | 627 | 113 | 226 | 115 | 356 | 86,270 |
| Mar. | 46,391 | 9,068 | 4,409 | 4,586 | 4,961 | 2,630 | 1,515 | 716 | 725 | 931 | 316 | 354 | 80 | 409 | 77,091 |
| Apr. | 52,520 | 8,295 | 4,854 | 5,351 | 3,177 | 2,308 | 1,407 | 703 | 1,518 | 750 | 144 | 956 | 40 | 445 | 82,478 |
| May | 48,475 | 5,112 | 3,152 | 3,682 | 2,937 | 2,314 | 1,417 | 996 | 1,437 | 854 | 201 | 468 | 37 | 277 | 71,359 |
| June | 38,821 | 4,787 | 6,814 | 3,948 | 3,075 | 1,593 | 1,624 | 695 | 2,215 | 672 | 687 | 507 | 24 | 520 | 65,882 |
| July | 41,114 | 4,993 | 4,839 | 3,559 | 3,205 | 2,388 | 2,023 | 1,056 | 2,918 | 1,039 | 253 | 519 | 30 | 465 | 68,401 |
| Aug. | 35,397 | 14,594 | 4,645 | 4,082 | 2,879 | 3,663 | 908 | 1,234 | 724 | 902 | 254 | 429 | 25 | 319 | 70,055 |
| Sept. | 32,912 | 17,010 | 3,889 | 4,691 | 1,908 | 3,511 | 1,224 | 1,235 | 853 | 672 | 253 | 361 | 91 | 477 | 68,453 |
| Oct. | 36,040 | 16,111 | 4,489 | 3,355 | 1,821 | 3,902 | 1,838 | 1,073 | 1,125 | 1,147 | 278 | 710 | 91 | 201 | 72,181 |
| Nov. | 41,097 | 13,141 | 3,082 | 3,776 | 2,709 | 3,221 | 1,275 | 1,226 | 1,453 | 861 | 253 | 595 | 62 | 318 | 72,564 |
| Dec. | 40,588 | 12,434 | 4,274 | 2,921 | 2,114 | 2,251 | 1,198 | 1,200 | 726 | 741 | 52 | 677 | 90 | 443 | 69,709 |
| 1930: | | | | | | | | | | | | | | | |
| Jan. | 44,911 | 11,106 | 4,207 | 3,862 | 2,842 | 2,805 | 910 | 826 | 332 | 612 | 209 | 552 | 200* | 577 | 73,949 |
| Feb. | 40,792 | 10,293 | 4,482 | 3,697 | 2,250 | 1,386 | 1,385 | 2,705 | 457 | 1,143 | 188 | 315 | 200* | 239 | 69,538 |
| Mar. | 42,216 | 12,346 | 4,354 | 4,289 | 3,776 | 2,663 | 1,083 | 1,153 | 975 | 678 | 358 | 322 | 200* | 263 | 74,676 |
| Apr. | 43,036 | 13,058 | 5,006 | 4,488 | 2,303 | 2,769 | 2,067 | 929 | 673 | 1,431 | 158 | 461 | 200* | 255 | 76,790 |
| May | 40,012 | 9,861 | 5,233 | 4,379 | 2,593 | 2,699 | 1,279 | 1,645 | 64 | 1,250 | 230 | 274 | 200* | 282 | 65,620 |
| June | 37,374 | 9,645 | 4,458 | 3,794 | 2,579 | 2,677 | 1,378 | 1,574 | 67 | 691 | 343 | 507 | 200* | 282 | 65,620 |
| July | 32,785 | 7,650 | 3,811 | 3,449 | 3,347 | 1,206 | 587 | 567 | 84 | 939 | 172 | 756 | 200* | 342 | 55,395 |
| Aug. | 34,513 | 8,369 | 3,953 | 3,515 | 2,108 | 2,170 | 886 | 149 | 265 | 888 | 37 | 747 | 200* | 450 | 58,250 |
| Sept. | 34,373 | 16,015 | 5,285 | 4,089 | 1,578 | 2,606 | 1,279 | 1,373 | 414 | 824 | 221 | 917 | 200* | 411 | 69,485 |
| Oct. | 44,385 | 9,095 | | 3,747 | 1,942 | | 2,460 | 2,782 | 609 | | | 1,132 | 200* | | |
| Nov. | 28,437 | | | | | | | | | | | | | | |

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are included in this compilation. *Figure is provisional; final figure will be shown immediately it becomes available.

## Domestic Production of Miscellaneous Rubber Goods

| | Rubber Proofed Fabrics | Rubber Heels | Rubber Soles | Mechanical Goods Shipments |
|---|---|---|---|---|
| | Yards | Pairs | Pairs | Dollars |
| 1924 | 25,020,000 | 186,279,000 | (1) | $48,615,000 |
| 1925 | 28,988,000 | 206,970,000 | 16,211,620(2) | 64,977,000 |
| 1926 | 29,328,000 | 183,812,000 | 12,253,000 | 76,789,000 |
| 1927 | 37,872,000 | 201,014,000 | 27,160,000 | 68,625,000 |
| 1928 | 41,179,000 | 235,179,000 | 37,645,000 | 69,114,000 |
| 1929 | 50,731,000 | 232,126,000 | 34,499,000 | 74,770,000 |
| 1929: | | | | |
| November | 4,395,000 | 17,863,000 | 3,400,000 | 4,932,000 |
| December | 2,291,000 | 14,781,000 | 3,003,000 | 4,751,000 |
| 1930: | | | | |
| January | 3,281,000 | 15,470,000 | 3,496,000 | 5,169,000 |
| February | 3,441,000 | 14,172,000 | 2,338,000 | 5,376,000 |
| March | 3,570,000 | 15,439,000 | 2,582,000 | 5,981,000 |
| April | 4,029,000 | 17,762,000 | 2,593,000 | 5,989,000 |
| May | 3,597,000 | 15,603,000 | 1,939,000 | 6,163,000 |
| June | 3,279,000 | 15,795,000 | 2,784,000 | 5,818,000 |
| July | 2,940,000 | 15,117,000 | 2,663,000 | 4,910,000 |
| August | 3,458,000 | 13,735,000 | 1,473,000 | 4,552,000 |
| September | 5,046,000 | 14,322,000 | 2,193,000 | 4,083,000 |
| October | 5,209,000 | 16,460,000 | 3,056,000 | 4,186,000 |

(1) Not available; (2) Last 9 months only.

Source: "Survey of Current of Business of the Department of Commerce."

## United States Imports of Guayule, Balata, Jelutong, Liquid Latex

*(All quantities in Long Tons)*

| | Guayule | | Balata | | Jelutong | | Liquid Latex (1) | |
|---|---|---|---|---|---|---|---|---|
| | Tons | Dollars | Tons | Dollars | Tons | Dollars | Tons | Dollars |
| 1919 | 1,430 | 760,690 | 727 | 937,038 | 8,332 | 2,213,964 | —— | —— |
| 1920 | 758 | 345,985 | 1,064 | 1,260,043 | 5,672 | 2,068,501 | —— | —— |
| 1921 | 58 | 26,945 | 814 | 1,077,859 | 1,745 | 351,893 | —— | —— |
| 1922 | 127 | 57,040 | 812 | 978,765 | 2,335 | 403,812 | —— | —— |
| 1923 | 1,155 | 542,227 | 700 | 898,524 | 4,565 | 853,303 | —— | —— |
| 1924 | 1,356 | 536,392 | 464 | 568,456 | 6,165 | 1,237,100 | 2,157 | 864,059 |
| 1925 | 3,781 | 1,803,448 | 517 | 574,750 | 6,749 | 1,642,531 | 3,853 | 3,537,810 |
| 1926 | 4,305 | 2,562,096 | 354 | 327,213 | 7,263 | 3,127,757 | 3,388 | 4,680,386 |
| 1927 | 5,018 | 2,674,957 | 582 | 447,246 | 7,785 | 2,448,657 | 1,116 | 876,077 |
| 1928 | 3,075 | 1,755,685 | 781 | 430,855 | 7,552 | 2,540,059 | 4,167 | 2,185,579 |
| 1929 | 1,231 | 545,175 | 728 | 566,964 | 8,203 | 2,458,136 | 3,728 | 1,787,997 |
| 1929: | | | | | | | | |
| Dec. | 100 | 41,328 | 25 | 19,955 | 550 | 156,939 | 281 | 132,265 |
| 1930: | | | | | | | | |
| Jan. | 150 | 55,272 | 28 | 28,549 | 509 | 141,384 | 407 | 194,703 |
| Feb. | 75 | 25,956 | 52 | 45,319 | 367 | 93,087 | 311 | 153,848 |
| Mar. | 148 | 50,007 | 16 | 12,498 | 522 | 128,844 | 279 | 107,847 |
| Apr. | 75 | 19,856 | 58 | 54,548 | 410 | 103,089 | 226 | 98,239 |
| May | 172 | 57,760 | 17 | 13,645 | 602 | 144,415 | 749 | 242,385 |
| June | 168 | 51,561 | 52 | 47,000 | 532 | 120,424 | 389 | 129,368 |
| July | 93 | 26,000 | 24 | 17,463 | 45 | 102,325 | 242 | 78,688 |
| Aug. | 50 | 14,000 | 11 | 5,600 | 766 | 168,511 | 944 | 253,127 |
| Sept. | 100 | 28,000 | 45 | 39,512 | 486 | 86,664 | 402 | 127,751 |
| Oct. | 64 | 18,527 | 36 | 30,702 | 490 | 113,638 | 306 | 99,637 |
| Nov. | — | —— | 73 | 61,650 | 389 | 84,219 | 332 | 65,265 |

(1) Latex import figures not available before 1924.

## Reclaimed Rubber in the United States

*(All Quantities in Long Tons)*

| | Consumption | | | | | Consumption | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Production | Tons | % to Crude | Stocks* | Year | Production | Tons | % to Crude | Stocks* |
| 1920 | 86,395 | 75,297 | 38.4 | ..... | 1925 | 132,930 | 137,105 | 35.6 | 13,203 |
| 1921 | 36,725 | 41,351 | 24.1 | ..... | 1926 | 180,582 | 164,500 | 45.9 | 23,218 |
| 1922 | 57,834 | 54,458 | 19.3 | ..... | 1927 | 189,144 | 178,471 | 47.6 | 24,980 |
| 1923 | 74,766 | 69,534 | 22.7 | ..... | 1928 | 208,516 | 223,000 | 50.4 | 24,785 |
| 1924 | 80,079 | 76,072 | 22.4 | ..... | 1929 | 218,954 | 226,588 | 48.4 | 27,464 |
| 1928: | | | | | | | | | |
| Jan. | 14,862 | 20,140 | 58.5 | 21,941 | July | 17,278 | 19,070 | 51.0 | 17,305 |
| Feb. | 15,291 | 18,670 | 55.4 | 20,848 | Aug. | 19,049 | 17,890 | 41.7 | 15,881 |
| Mar. | 17,069 | 20,680 | 57.9 | 19,558 | Sept. | 18,693 | 17,795 | 44.6 | 17,991 |
| Apr. | 15,898 | 19,280 | 58.8 | 19,283 | Oct. | 17,182 | 18,420 | 45.1 | 17,026 |
| May | 18,945 | 20,215 | 54.1 | 18,137 | Nov. | 18,245 | 18,380 | 49.1 | 22,399 |
| June | 18,781 | 18,140 | 48.2 | 18,709 | Dec. | 17,728 | 14,320 | 45.9 | 24,785 |
| 1929: | | | | | | | | | |
| Jan. | 18,685 | 21,068 | 49.1 | 24,394 | July | 18,387 | 20,236 | 48.7 | 19,679 |
| Feb. | 18,094 | 19,829 | 47.7 | 23,305 | Aug. | 19,787 | 18,230 | 47.6 | 22,309 |
| Mar. | 19,984 | 20,867 | 48.7 | 22,076 | Sept. | 18,660 | 17,071 | 49.2 | 24,984 |
| Apr. | 19,899 | 22,435 | 47.8 | 20,680 | Oct. | 18,885 | 18,744 | 53.8 | 25,117 |
| May | 20,385 | 23,176 | 47.1 | 19,479 | Nov. | 14,363 | 15,330 | 55.4 | 26,080 |
| June | 18,416 | 18,141 | 42.0 | 17,980 | Dec. | 13,429 | 11,531 | 49.0 | 27,464 |
| 1930: | | | | | | | | | |
| Jan. | 15,010 | 17,454 | 47.6 | 24,241 | July | 12,322 | 12,384 | 42.3 | 23,873 |
| Feb. | 15,846 | 14,559 | 44.5 | 24,243 | Aug. | 12,047 | 10,985 | 35.9 | 22,980 |
| Mar. | 17,400 | 15,241 | 42.2 | 24,415 | Sept. | 11,483 | 10,480 | 41.4 | 21,996 |
| Apr. | 17,828 | 16,904 | 42.0 | 24,587 | Oct. | 12,349 | 10,724 | 39.3 | 21,145 |
| May | 17,812 | 17,052 | 42.7 | 23,356 | Nov. | 10,763 | 8,816 | 37.5 | 24,007 |
| June | 15,714 | 14,063 | 40.8 | 24,449 | Dec. | ..... | ..... | ..... | ..... |

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,369 tons in 1929

(Rubber Manufacturers' Association figures raised to 100%)

# REVIEW DESK

***Books. New Publications. Catalogues. Etc.***

THE ELECTROMETRIC DETERMINATION OF THE HYDROGEN ION CONCENTRATION ON THE LATEX OF HEVEA BRAZILIENS'S AND ITS APPLICABILITY TO TECHNICAL PROBLEMS. By N. H Van Harpen. Published by Varekamp & Company, Medan. 1930. 460 pp.

As a study of the coagulation and flocculation phenomena in rubber latex, this work represents the most painstaking effort that has been given to the subject. More than 150 authors on the subject of latex treatment were consulted, while 160 pages of tables are used in investigating the relationship between the phenomena of coagulation and the real degree of acidity of the medium used. Coalescence in the flocculation stage and the centrifugation of latex are also treated at length, and the work is concluded by a general summary of the investigations grouped under 36 headings.

ANTIOXIDANTS. Published by the Rubber Chemicals Section, E. I. du Pont de Nemours & Company, Wilmington, Del. 1930. 32 pp. For free distribution.

Antioxidants, including heat resisters, stiffeners and fatigue inhibitors, have now come into practically universal use in the rubber manufacturing industry. The term, as it is now applied, covers all materials added to rubber compounds for the purpose of retarding deterioration, whether that deterioration be due to the depolymerizing action of heat, to oxidation, or to the repeated application of tensile or compressive forces. Descriptions of all du Pont antioxidants are given in this booklet, together with the results of aging tests, flexing tests and abrasion tests on several compounds.

COTTON FACTS—1930. Published by the Shepperson Publishing Company, 44 Whitehall Street, New York City. 1931. 256 pp.

Accurate data on any generally used commodity is absolutely essential, and the fact that this publication is now in its 55th edition is evidence that it is accepted as an authoritative compilation of statistics in its field. The tables on the American crop have been covered with especial thoroughness, the rayon industry section has been enlarged, and other additions have been made to the figures of previous years. All necessary data is presented on crops, receipts, stocks, exports, imports, visible supply, sales, prices, consumption and manufacturing output.

INDEX TO A. S. T. M. STANDARDS AND TENTATIVE STANDARDS. Published by the American Society for Testing Materials, 1315 Spruce Street, Philadelphia, Pa. 1931. 120 pp. For free distribution.

This index is a compilation, under appropriate key words, of titles of all A. S. T. M. standards and tentative standards, together with the volume references to the publications in which they appear. The list is complete as of September, 1930. There are fifteen listings under "Rubber Products" and many important listings under the general heading of "Textile Materials."

FINANCIAL STATEMENTS IN ANNUAL REPORTS TO STOCKHOLDERS. Published by the Policyholders Service Bureau, Metropolitan Life Insurance Company, 1 Madison Avenue, New York City. 1931. 72 pp. For free distribution.

The increase in the extent of ownership of corporation securities by the public is responsible for the need of more informative and readily understandable financial reports. This policy has been adopted by some of the larger rubber manufacturing companies. Executives in the industry will, therefore, find this survey of timely interest. Prepared after the examination of 500 annual reports of various banks and industrial companies, this study analyzes in detail the treatment of the balance sheets, profit and loss statements and surplus accounts of many representative firms.

COMMUNITY PLANNING IN UNEMPLOYMENT EMERGENCIES. Compiled by Joanna C. Colcord. Published by the Russell Sage Foundation, 130 East 22nd Street, New York City. 1930. 90 pp.

A strong recommendation that the emergency employment committees set up through the country to deal with the present situation do not disband when the emergency is over, but continue to study and plan how to reduce seasonal, technological and other unemployment is contained in this report. These committees would then be prepared for the first signs of the next emergency. Long range planning of public and private work which can be promptly undertaken in a period of unemployment is urged.